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JPRS L/5022-2

6 September 1974

PROCEEDINGS OF THE FIRST CONFERENCE ON PSYCHOTRONIC RESEARCH PART II

AMERICAN REVOLUTION BICENTENNIAL 1776-1976

Approved for Release
Date OCT 1996

U. S. JOINT PUBLICATIONS RESEARCH SERVICE

C00023069

BIBLIOGRAPHIC DATA SHEET	1. Report No. JPRS L/5022-2	2.	3. Recipient's Accession No.
4. Title and Subtitle PROCEEDINGS OF THE FIRST CONFERENCE ON PSYCHOTRONIC RESEARCH, Part II			5. Report Date 6 September 1974 6.
7. Author(s)			8. Performing Organization Rept. No.
9. Performing Organization Name and Address Joint Publications Research Service 1000 North Glebe Road Arlington, Virginia 22201			10. Project/Task/Work Unit No. 11. Contract/Grant No.
12. Sponsoring Organization Name and Address As above			13. Type of Report & Period Covered 14.

15. Supplementary Notes

KONFERENCE O VYZKUMU PSYCHOTRONIKY, parts I and II, published in Prague in 1973

16. Abstracts

This report contains the proceedings of the First Conference on Psychotronic Research. The articles examine various aspects of the philosophical-psychological and technical-physical concepts of comprehending psychic phenomena.

17. Key Words and Document Analysis. 17a. Descriptors

Czechoslovakia
Atmospheric Physics
Psychology
Physiology
Radiobiology
Biochemistry
Bioengineering
Stress Physiology
Terrestrial Magnetism
Power Sources
Mathematics and Statistics
Accoustics
Optics
Electricity and Magnetism
Laboratories, Test Facilities, and Test Equipment
Geology and Mineralogy

17b. Identifiers/Open-Ended Terms

17c. COSATI Field/Group 04, 05, 06, 08, 10, 12, 14, 17, 20

18. Availability Statement U.S. GOVERNMENT USERS ONLY Sold by NTIS Springfield, Virginia 22151	19. Security Class (This Report) UNCLASSIFIED	21. No. of Pages 225
	20. Security Class (This Page) UNCLASSIFIED	22. Price

FORM NTIS-35 (REV. 6-72) THIS FORM MAY BE REPRODUCED USCOMM-DC 14952-P72

C00023069

JPRS L/5022-2

6 September 1974

PROCEEDINGS OF THE FIRST CONFERENCE ON PSYCHOTRONIC RESEARCH

PART II

Czech-, Russian-, French-, and English-language collection of papers presented at the First Conference on Psychotronic Research; KONFERENCE O VYZKUMU PSYCHOTRONIKY, Prague, 1973, 401 pages

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[Continued from Part I]

THE NATURE OF THE EXTREME VALUE OF SKIN POTENTIALS AT ACUPUNCTURE POINTS

[Paper by Viktor Vereshchagin, senior scientific staff member, USSR, in Russian]

[Text] The fact of the existence of extreme values of the electric potential of the skin in animals and man was established at a comparatively early date. With a change in the potential of a relatively arbitrarily chosen region of the surface of the skin, one can detect a large number of points where the potential has a minimum and maximum value from a few up to tens of millivolts. At these points of the skin the resistance to an electric current is altered (reduced).

The first systematic study of the electrical resistance of the skin was conducted by V. A. Poderni (1, 2). He also confirmed the Al'brekht phenomenon, which consists in an increase in the electrical conductivity of the skin in Head's (Zakharin's) zones when a pathological process is taking place in organs corresponding to those zones. The writings of A. K. Podshibyakin (3, 7), and also a number of other writings (8, 9), have observed a number of peculiarities of potentials and electrical resistance and also of their dynamics both in the normal and pathological state; we will now note here only one of the most important of them: the points of extreme values of skin potentials coincide with projections on the skin of the so-called "points of application" used in acupuncture.

In the literature known to us not a single attempt has been made to explain the nature of these potentials. In the first place this circumstance makes it more difficult to work out theoretical conceptions concerning the very experimental facts in particular and concerning acupuncture in general, and in the second place it considerably reduces the prognostic and therapeutic value of this important and objectively measurable index of physiological processes in the organism. Finally, all these circumstances taken together are impeding the broad introduction of acupuncture methods into clinical practice.

In the present paper certain hypotheses are set forth concerning the nature of the experimental values of electric potentials and the electrical

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resistance of the skin. In constructing a working model we took as our foundation, first, the proposition well known in electrophysiology to the effect that all processes of vital activity are accompanied by the appearance of a difference in potential on the two sides of the cell membrane, and, second, a hypothesis concerning the existence in living organisms of a special system with heightened electrical conductivity (Bekker, 1964).

When we look at the basic experimental fact of electrophysiology, which is that the external surface of the cell carries a positive charge, while the internal surface has a negative charge, with a difference in the potentials on the order of hundreds of millivolts, and also taking into account the results of Bekker's work, we will examine the following working model:

Every cell can be represented as a capacitor in which the difference in potentials at the cell membrane is created by means of the membrane potential. The entire organism can be represented as the sum total of capacitors connected in parallel. The positive place of capacitors (the external surfaces of cells) are enclosed within a circuit by a direct contact, while in the cell the analogous connection is made by the electrolytes of the blood plasma and the lymph.

Since an electric current flows through the cell membrane, as indicated by the difference of potentials, to close the external circuit (external relative to the membrane) there must be a system of conductors or channels of heightened conductivity that unite the negatively charged internal surfaces of all cells of the organism with one another.

Every hypothetical model must meet the requirement of explaining the facts that exist and also must predict new ones. In our case, first, the very fact of the existence of regions with an extreme value of electric potentials of the skin is explained if we take as our point of departure the idea of the anisotropy of resistance of living tissues. Thanks to the heightened conductivity of the channels with heightened conductivity at those points where they come closest to the surface of the skin, the sign and magnitude of the potential of the internal membranes of cells can be induced. On the basis of the model of parallel connection of cells (capacitors) we have adopted, the sign of the potential should be negative, and its magnitude should always be smaller than the difference in potentials at the membrane of individual cells (because of the resistance of the channels themselves and of areas of the skin over corpuscles). In the normal case both these conclusions correspond to the results of experiments.

Moreover, thanks to fulfillment of the law of conservation of charge, any changes in the metabolism of cells and groups of cells (in organs) ought to be manifested in a change in the difference in potentials at cell membrane and consequently on the skin. This mechanism is, of course, reversible and could be useful in understanding a large number of pathological processes. In particular, the very method of treatment by acupuncture is based on this reversibility.

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Also, as metabolism increases, the difference in potentials ought to increase, since hyperfunction is the adequate form of the reaction to stimulation. In (4) it has actually been demonstrated that when the organ is stimulated (for example, when food enters the stomach), the difference in potentials at the "active points" corresponding to this organ increases.

Here it is worth noting that the electrical properties of the "points of application" are difficult to explain on the functioning of just one nervous system. It is well known that the propagation of an electric signal in a nerve takes place by means of the potassium-sodium pump and is by nature a pulsed process, while the distribution of potentials is statistical in nature. Moreover, according to the data presented in (2), the topography and magnitudes of the potentials do not change during a period of 8-12 hours after the death of the organism. It is nonsense to talk about the functioning of the nervous system in this connection.

In addition, the topography of the "points of application" coincides with the topography of the nervous system only in rare cases (along the track of the principal nerve trunks). In most cases, this is particularly true of the traditional "channels," there is no direct correspondence. But the connection between the central nervous system and the character of the change of the skin potentials has been demonstrated experimentally.

The interesting fact of asymmetry of electrical resistance in the direction of the channel and against the direction of the channel (the direction conforming to ancient tradition is referred to) is noted in (9). Unfortunately the paper does not report the conditions of the measurements (particularly the polarity of the electrodes with respect to the channel). But it is quite obvious that the carrying of the charge along the channel is capable of bringing about reduced resistance along the track of the channel.

Facts well known in electrophysiology and acupuncture can be qualitatively described on the basis of the model we have proposed. Moreover, we can seek ways of solving such problems as perception of an ultrahigh-frequency field in the form of various noises and sounds during exposure. Or changes in the way people feel because of a change in the state of ionization of the atmosphere before the weather changes and also because of a change in solar activity. The capacitor model is particularly intriguing from the standpoint of the possibilities of generation of the difference of potentials by means of a willful increase in the level of metabolism through a trophic influence in some specific organ (This possibility is supported by the data contained in (5) concerning the influence of the functional state of the large hemispheres of the brain on the character of the dynamics of the potentials at the "active points.") with its subsequent transmission to another organism. Such experiments, called "healing by the laying-on of hands," have been described in the popular literature (we do not have reports of a scientific nature on this topic).

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Finally, using this model it is possible to work out new lines of research in electrophysiology that could lead to the creation of physiotherapeutic methods incomparably more effective than those engendered by acupuncture.

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ELECTROPHYSIOLOGICAL AND BEHAVIORAL CORRELATES OF ACUPUNCTURE THERAPY

[Paper by David E. Bresler, Ph.D., director of research, National Acupuncture Association, 1033 Gayley Avenue, Los Angeles, California, in English]

[Text] It has been suggested by several investigations that acupuncture therapy represents only an effective use of hypnotic techniques and that its success can be explained on the basis of prior indoctrination, autosuggestion, expectation, counterirritation, distraction, etc.

In preliminary experiments with naive human subjects, we have observed a variety of electrophysiological changes following the insertion of needles into traditional acupuncture points, while no systematic effects occurred when adjacent placebo points were stimulated. For example, heart rate and EEG beta activity were increased by tonification of the "tsu san li" points (which are used to produce general sympathetic arousal) while no consistent changes occurred with tonification of nearby points. Sedation of the "sun nan" points (used to treat insomnia) produced substantial increases in EEG alpha activity while placebo points were without effect.

In other preliminary studies, we have observed that the galvanic skin potential (GSP) at certain acupuncture points appears to change with heart rate and respiration rate while no systematic changes in the GSP of other surface areas of the skin could be observed.

We have also determined that specific acupuncture points can be used to suppress the "gag reflect," while adjacent placebo points were, again, without effect.

In addition, we have successfully used acupuncture therapy for treating a variety of illnesses such as emphysema laminitis and facial paralysis in horses, dogs and cats. We have also successfully achieved gingival analgesia in five squirrel monkeys.

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In all of the human experiments, subjects were given no prior information about the procedures employed and these results can therefore not be explained on the basis of a "hypnosis" notion.

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POINTS OF HIGH ELECTRICAL CONDUCTIVITY ON THE INTEGUMENT OF ANIMALS AND OTHER LIVING THINGS

[Paper by Yevgeniy Mikhaylovich Pyatkin, senior scientific staff member, Moscow, USSR, in Russian]

[Text] The seemingly mosaic and asymmetrical nature of metabolism, temperature, electrical processes, and other phenomena in the tissues and organs of animals and man are a phenomenon inherent in life. Fluctuations of physiological processes and their clusterization are one of the many mechanisms of autoregulation of the organism's homeostasis.

The organism perceives changes in the environment and accordingly activates its physiological state for purposes of protection against them or departure from them. This basic function of the organism is performed by a complex system of physiological regulation. It includes the following:

1. Numerous neuroreceptive organs and structures;

2. Perielectrotonic or anelectrotonic influences which change the excitability of specific portions of the central nervous system even before the pulses of neural reflexes arrive there;

3. Certain electromagnetic influences of operative cells, organs, and organisms;

4. Active points of the skin (acupuncture), possibly representing a new morphological system in which, as in other receptor systems of the organism, stimulative pulses are transmitted to the central nervous system to normalize its functions.

Points of high electrical conductivity are specific morphophysiological structures which, as shown by Soviet and foreign research, have higher magnitudes of electric potentials and temperature of the skin and possess a lower electrical resistance and higher level of redox processes. Points of high electrical conductivity of the skin (active points) are located on the integument in a definite order. Their excitation causes a certain degree

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of physiological and pathological alteration of organs and systems of the organism of animals and man. At the same time, a change in the physiological and mental state causes a change in the conductivity of the acupuncture points (1).

Our research and observations of active points of the skin of cows, horses, calves, hogs, dogs, rats, chicken and duck commercial and incubated eggs, and potatoes were by way of a preliminary survey and above all described the dependency of points of high electrical conductivity on the general state of the specimens under study. These points of high electrical conductivity were determined by means of a miniature electronic instrument designed by V. G. Adamenko. The skin or other integument studied must be dry, free of grease, and clean. A signal light on the instrument lights when its tip--a silver electrode--is applied to a point of high electrical conductivity. The researcher holds in one hand an instrument used to press against the active points of the skin, while the other hands, closing the electric circuit, presses against the body of the animal or other specimen a cotton tampon soaked in saline solution. The places on the skin of animals being studied were swabbed with alcohol or ether, and the fur was sheared.

1. The topographic characteristics of the points of high electrical conductivity of the skin of farm animals corresponds almost entirely to the location of the Chinese acupuncture points indicated in (2). We should note that there are more points of high electrical conductivity on the skin of animals than acupuncture points, and that certain points of high conductivity may be lacking in certain animals as a function of the functional conditions. In other words, on the skin of animals there are points of high electrical conductivity which are constant and points which are "flickering," i.e., points which are manifested as a function of the organism's functional state. Table 1 shows the points of high electrical conductivity of the skin of a cow (one side of the body), excluding points on the extremities and the lower portions of the body.

Table 1

Skin Region	No of Active Points With High Electrical Conductivity	No of "Flickering" Points With High Electrical Conductivity	No of Acupuncture Points
Head	22	8	18
Neck	10	6	6
Withers	14	--	11
Small of back	18	6	11
Croup	16	8	10
Udder	2	--	2

Thus we found not only that the acupuncture points coincide topographically with points of high electrical conductivity on skin of animals, but we also discovered other points with high electrical conductivity.

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2. It was established that points of high electrical conductivity on the skin of various animals are absent after clinical death. This demonstrates that existence on the skin of the animals of points of high electrical conductivity is not purely an electrophysical phenomenon, but that the active points are a physiological characteristic of the healthy living organism.

3. An increase in the number of points of high electrical conductivity in the region of the croup was observed in certain cows before calving. During calving, in the period of labor pains, the number of points diminishes, but their number is restored during pauses in labor.

. In three cases of parturient paralysis of the cows the instrument indicated the presence of points of high electrical conductivity of the animal's skin "without" closing the electric circuit, i.e., to obtain the signal it was sufficient to apply the tip of the instrument to the active point of the skin without contact of the other hand that closed the electric circuit. We should note that manifestation of the signal from points "without" closing the electric circuit has previously been observed in human beings by V. G. Adamenko.

5. Points of high electrical conductivity of the shell of commercial chicken and duck eggs were investigated. The results were negative. No points of electrical activity were observed, and the instrument produced no signals. A verification of the points of high electrical conductivity on the shell of incubated eggs did produce signals of the instrument in 20 percent of the cases at the blunt end of the eggs after 4 or 5 days of incubation. Potatoes with no sign of growth of the eyes were also examined. The research showed that such potatoes do not have points of high electrical conductivity, whereas sprouting potatoes give signals concerning the existence of points at the "eyes."

Conclusion

The data of our preliminary survey require additional observations and research concerning all these aspects of detection of points of high electrical conductivity on the skin of animals, their origin, and their functional importance. We obtained data with these animals that confirm the coincidence of acupuncture points and points of high electrical conductivity previously observed in human beings. We should note that these points may be detected without closing the electric circuit with the experimenter's other hand. A proper explanation of this phenomenon cannot be given at the present time because of the lack of detailed research. But the physical (in accordance with V. G. Adamenko's hypothesis) and physiological foundation of an explanation might be presented as follows: the electric circuit might be closed by displacement currents in connection with the occurrence of the variable component of the signal from the points. It is also possible that the d-c circuit is closed through the air because of its slight ionization. From the physiological standpoint the occurrence of a special state of the active point of the skin may be related to an abrupt intensification of any function of the organism.

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We should call attention to the fact that the activity of the points of high electrical conductivity of the skin is not the same in healthy and sick animals. Thus in healthy animals the active points of the skin disappear only after clinical death, whereas in sick animals they may be absent even when they are alive. This indicates once again that the physiological reactivity of sick and healthy animals is different in nature.

The existence of points of high electrical conductivity on the skin, as investigation of the "flickering" points demonstrate, depends both on the animal's internal state and also on external factors. It is sufficient to moisten the skin of the animal, to exert a prolonged mechanical or electrical effect on it, for active points to appear at these places. This paper concerning investigation of points of high electrical conductivity on the skin of animals is the first stage in a series of projects along this line.

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MAN--PLANT COMMUNICATION EXPERIMENTS

[Paper by Marcel Vogel, PhD, Senior Chemist, IBM, San Jose, California in English]

[Text] The primary purpose of this paper is to present the experimental procedures necessary to conduct interactive experimentation between man and the plant form. The necessary conditions to develop the experimental procedures needed for repeatable experimentation will be outlined and presented in graphical form. It is necessary that a plant be obtained which is sufficiently adapted to the environment in which the experimentation is being conducted. The basic class of house plants known as Philodendrons, were found to be most suitable for initial experimental procedures. Two forms of Philodendrom were used. Number 1, the Ivy Philodendron, Philodendron Caudidium, and number 2, the Monstera class, Monstera Deliciosa, or large split-leaf Philodendron. The large Ivy Philodendron is a very easy plant to work with, but for extended experimentation, the larger cut-leaf Philodendron is preferred.

It was found that a period of adaptation is required for any plant used for experimental procedures. The time of adaptation may vary from one week to two months. What was found is that an inconclusive base line, continuously shifting, and random variation of signals were encountered when a plant would not adapt to the experimental conditions that were being imposed upon it. When a plant has become adapted, a stable base line can be achieved within minutes. It is achieving this stable uniform base line that has been the primary objective of these lines of experimentation, for without this base line there is no way to identify the signals that one encounters, or to determine their causitive origins and their source.

The instrumentation for the experimentation was assembled and patterned after suggested experimental designs proposed by L. George Lawrence in articles published in Popular Electronics, in the years 1969 and 1970.

While the equipment used is exceedingly simple, the obtaining of reproducible results is exceedingly difficult, as the problem is not in the equipment or

the plant itself but lies in the ability of the experimenter to relax and stabilize his body functions to enable him to focus simple direct action to his mind. To achieve this end, meditation exercises are recommended. The restraint of use of alcoholic beverages and smoking during any form of the experiment is advised. The consumption of large volumes of water and the quieting of the body functions are necessary. Once a critical link is established between the experimenter and the plant, large amounts of noise, light, or electrical disturbances do not interfere with the production of responses from the mind of the experimenter. Simultaneous experimentation with the use of multiple channel recording, comparing the body functions to the plant response, has given evidence that a one-to-one correspondence can be had between the galvanic skin response of the individual and a similar response in the plant. One can further get identical responses by appropriate suggestion in the mind of the subject, experimenter and plant. When the attention is focused into the plant then the normal galvanic skin reactions cease on the individual.

Experimental work during the last four years is summarized with the following conclusion;

1. To establish any link between man and plant, an initial charge must be released by the person doing the experiment to the plant under experimentation. This charging phase must be continued until a stable base line is obtained.

This charging by the experimenter produces an isolation of the plant from secondary influences, i.e. light temperature, and electrical charges in the room. The charging of a plant can be accomplished either in the room or at remote locations over one-hundred miles distant.

2. When the plant is charged the experimenter must quiet his conscious mind and body functions, and work in as an emotion-free state as possible. The higher the level of emotional control, the more precise the experimental results become.

3. The experimenter may then focus his mind to get a response to,

   a. The act of damaging the leaf of another plant

   b. The destruction of another life form, cellular or animal.

   c. The release of a thought form of

      a) Love

      b) Healing

      c) Mathematics

      d) Imagery

      e) Emotion

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Each of these thought forms have distinct patterns attended to them.

Data reduction is now being done to identify each of these actions.

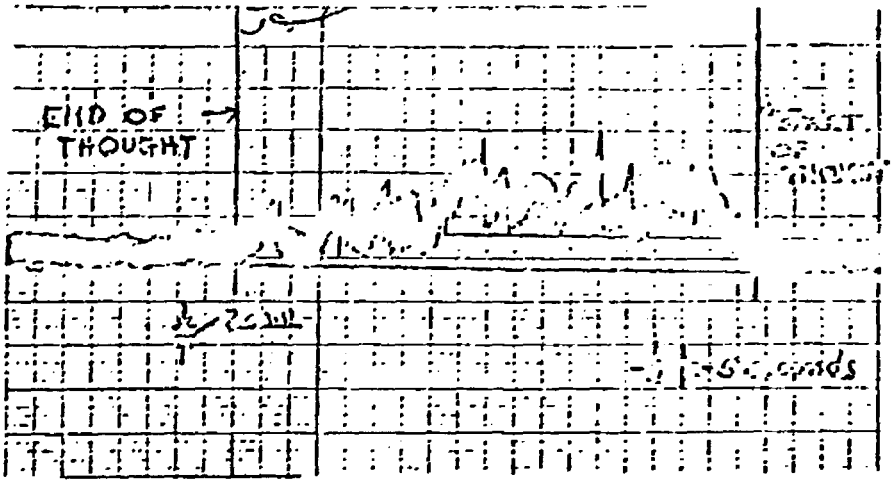
4. Distant projection of thought forms have been accomplished with up to one-hundred and ten miles separating the plant and the experimenter.

5. Repeatability of experimentation in any one experiment is possible. Thought forms of individuals can be repeated. It is still very difficult to get multiple repeatability over a period of time for any one class of experiments.

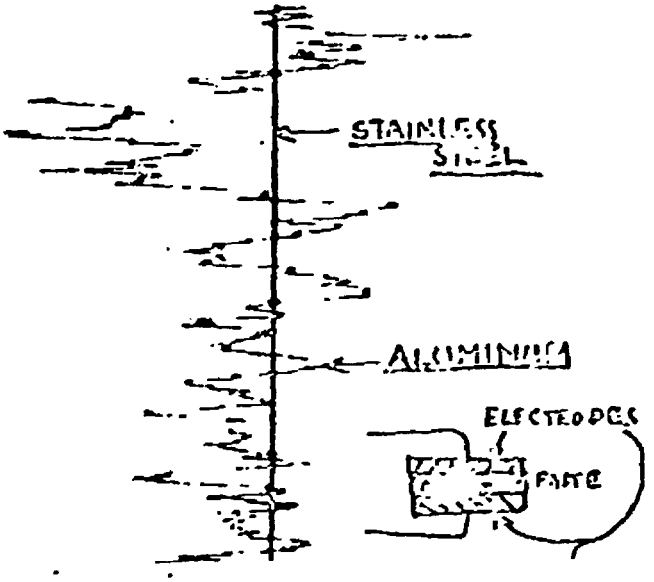
The equipment used for these tests was a modified poly-graph recorder which was electroded to the plant via one inch by one and half inch stainless steel electrodes, the adhering paste was agar agar with one percent sodium chloride added.

Studies were conducted on various types of electrode material, independent of the plant. The least stable system was aluminum-agar-aluminum and the most stable was a system using silver electrodes chemically treated to form a silver chloride layer. The standard, polished stainless-steel electrodes between agar show no obvious deviation, when balanced into the bridge, over a period of twenty-four hours. The aluminum electrodes in contrast showed continuous signal deviation, an impossible condition for any practical use.

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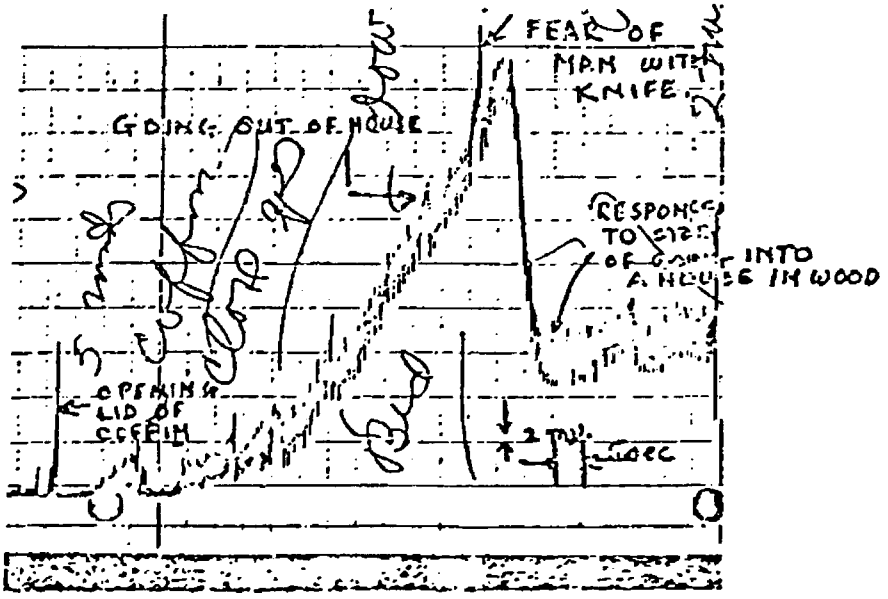
RECORD OF THOUGHT (LABORATORY EXPERIMENT) FROM PLANT



ELECTRODE REACTION
(WITHOUT PLANT)

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GROUP RESPONSE (15 PEOPLE)

RECORDED BY PLANT.

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PURSUING THE SECRET OF THE DOWSING ROD

[Paper by Jiri Bradna, MD, Neurology Department, Okres Institute of Public Health, Kutna Hora, Czechoslovakia, in Czech]

[Text] Man's contact with nature, once very close, has been constantly disrupted with the progress of civilization. Old knowledge of natural phenomena passed through the crucibles of scientific laboratories, and only its sound core has been retained. But many secrets of the old alchemists, the fine, subtle half-truths and fantasies, have thereby been lost in the smoke blown away by critics and the exact sciences. Thus also the dowsing rod, with its traditions dating back several milleniums, has been replaced by modern methods of prospecting [1, 2, 3]. However, the dowsing rod remains a signpost along the path that connects man with his original natural environment, a link between man who is isolated in prefabricated apartments, office buildings, shops and in speeding cars on the one hand, and the beauty of nature, the forests and waters, open skies, clouds and storms on the other. It still proves our ancient relationship with nature, through which we have passed in our entire development, and from which we are becoming separated even at the cost of our self-destruction. For the dowsing rod is a sensative indicator of our reactibility to the effects of the environment, and therefore its significance has not declined, despite the modern instruments for detecting various energies. It is a mediator between our neuromuscular system and the energies arising around us.

Therefore it is unnecessary to measure the dowsing rod's electric potential or to speak about the force with which it twists our hands. It is sufficient to investigate the force of the muscles that turn the dowsing rod. Already Athanasius Kirchner had called attention to this fact, in 1875. When the dowsing rod is held in the customary underhand grip, or even in an overhand grip with the hands turned around, the forked rod's elasticity increases the tension in the muscles of the forearms and hands. In neutral position the rod is held horizontally by the counteracting agonistic and antagonistic muscle groups, in our case by the flexors and extensors of the hand and fingers, with the assistance of the pronators and supinators. The dowser walks slowly over the terrain and watches

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the motions of the dowsing rod. At a point over underground water or a container filled with water, the rod starts to deflect, usually upward, but downward for some dowsers. The dowser has the feeling that the rod is twisting by itself, and that he cannot prevent its deflection. Actually the deflection of the dowsing rod is caused by a subconscious reaction of the muscles, and it takes a moment for the rod to assume a new position. The magnitude of the rod's deflection depends on the ratio of the tension in the individual muscle groups that hold the dowsing rod. This can be demonstrated by modern electrophysiological methods, for example, by electromyography, myotensiometry or vibrotensigraphy [4, 5, 6]. Over an ore deposit or iron, the rod will turn in the opposite direction, usually upward. Only in a small proportion of persons (about 20 percent) the rod will not deflect either over water or metal, and we observe only a light vibration of the rod. This is caused by an even increase or decrease of muscle tension in both muscle groups of the forearms, and thus there will be no resultant change in the tension of the muscles on the hands holding the dowsing rod.

How do we explain this distant effect of water or metal on the forearm muscles holding the dowsing rod? An explanation is not easy. The effect of various telluric rays, rays of matter or water, the effect of the water's magnetism or electromagnetism arising in the course of its flow underground, changes of geomagnetism, ionization of the air over springs, etc. had been assumed [7, 8, 9].

We actually began to analyze the complex question of the reactions of the dowsing rod and of dowsers when we successfully located a well, using an air-filled balloon instead of a dowsing rod. With this balloon we recorded the changes in palm pressure as the hand approached water or metal. We developed a myotensiometer to measure muscle tension (patent 118558, Bradna) and determined the quantitative relationships of the water's distance and quantity, the torsional force measured on the dowsing rod, and the muscle tension (Fig. 1).

Electromyography with skin and needle electrodes, and myotensiometry proved that already the grasping of the dowsing rod is accompanied by the activation of the flexors and extensors, and that the frequency and amplitude of the action potentials in the flexors usually increase upon approaching water. Upon approaching metal, however, the frequency and amplitude of the action potentials decline, and the dowsing rod's deflection, after a certain period of latency, is due to the dominance of the activized muscle group (Fig. 2).

Myotensiometry, proved that the effect of water and metals changed the muscles' resting and action tonus even without holding the dowsing rod. We also established the directional effect of the muscles controlling the dowsing rod's motion when seeking water, and the feasibility of shielding the water's distant effect upon man, by means of conductors wrapped in metal foil. Furthermore, we were intrigued by the fact that the muscles holding the dowsing rod react to the activity of another person's muscles

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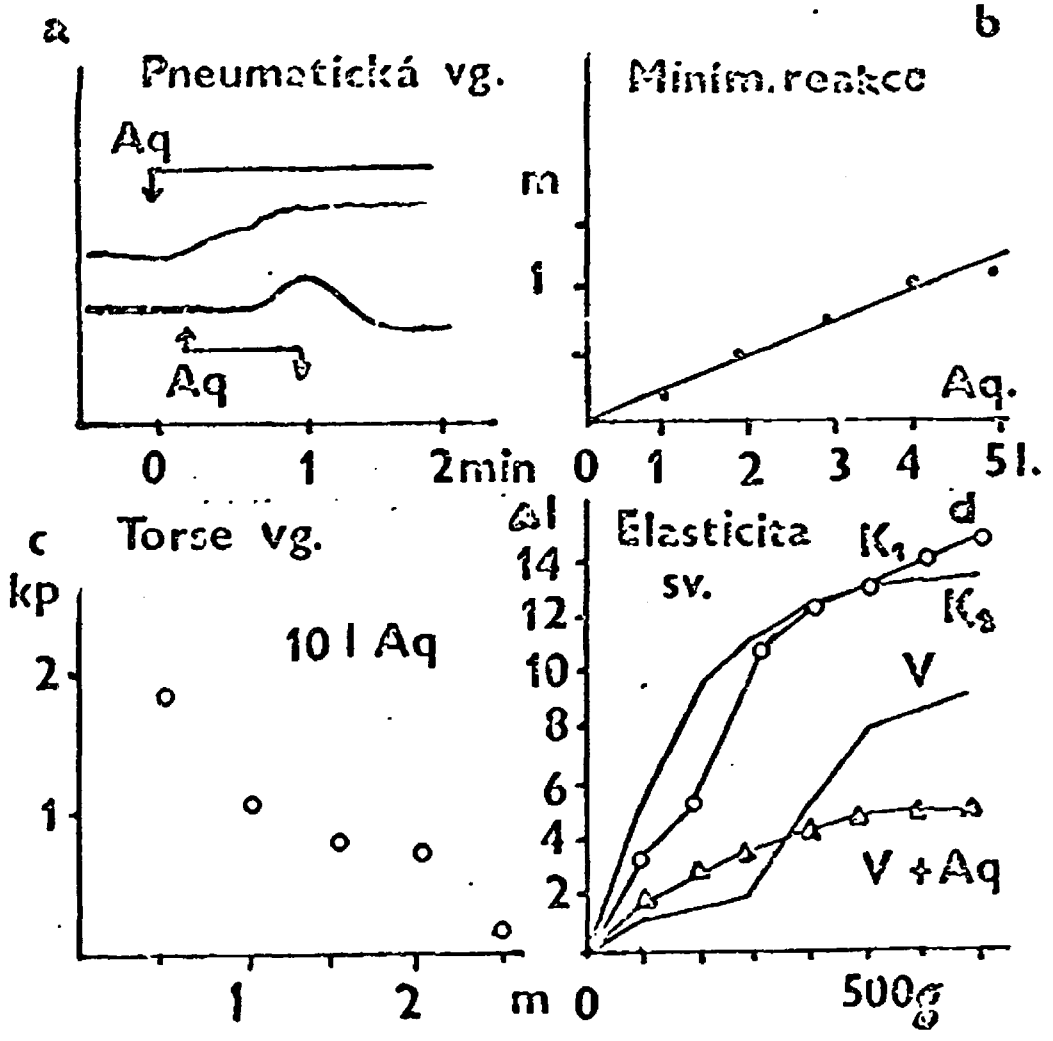


Figure 1. a. Pneumogram showing the effect of 2 liters of water (Aq) approaching the forearm muscles while the pneumatic dowsing rod is held in the hand.
b. Dowsing rod's minimal reaction to water, in liters.
c. Decline of muscle force with the increasing distance of 10 liters of water, measured as the dowsing rod's torque.
d. Change of muscle elasticity, measured as the contraction of the muscles at rest (K), after grabbing the dowsing rod (V), and when water approaches the dowsing rod (V + Aq).

even at a considerable distance, with a change of muscle tension and thereby with the dowsing rod's resultant deflection [a paper read at Professor Prusik's department in 1942] (Table 1 and Fig. 3).

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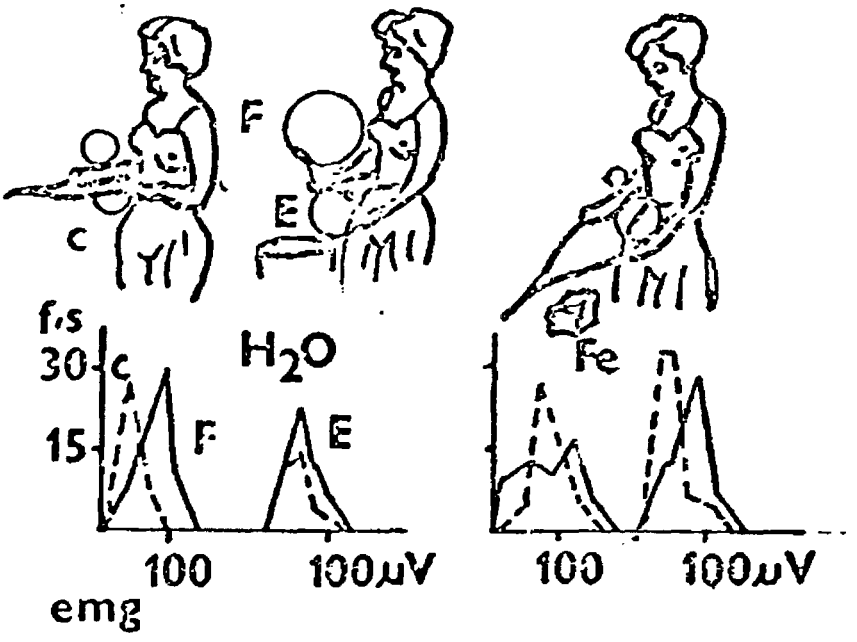


Figure 2. Dowsing rod's reaction.
- F - Flexors;
- E - Extensors of the forearm
- H_2O - Ten liters of water;
- Fe - Ten kilograms of iron;
- emg - Frequency analysis of electromyograms taken with skin electrodes;
- C - Control at a neutral point where there is no water or metal;
- f/s - Action potentials' frequency per second;
- μV - Amplitude of the action potentials, in microvolts.

Table 1. Distant Effect of Water, Iron and Myotransfer, on the Forearm Flexors of 140 Subjects (A - water, B - iron, C - myotransfer)

	Control					
	Resting	Action	Resting	Action	Resting	Action
A	1.71±0.02	3.293±0.07	2.325±0.01	4.821±0.03	1.80±0.04	3.852±0.15
B	1.71±0.02	3.293±0.07	1.640±0.03	2.910±0.04	1.88±0.06	3.465±0.20
C	1.71±0.02	3.293±0.07	2.880±0.03	5.440±0.15		

We called this distant effect of one person's muscles on those of another energy myotransfer and continued to investigate its cause.

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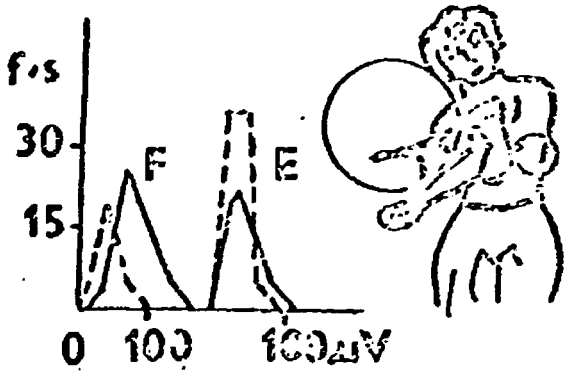


Figure 3. Myotransfer and the dowsing rod.
f/s - Action potentials' frequency per second;
F - Flexors;
E - Extensors.

After numerous experiments with reflecting and filtering the presumed muscle radiation, with passing it through grids of different width and conducting it over waveguides, we investigated the region of vhf electromagnetic waves (Fig. 4). Using vhf monitors, we were able to demonstrate that the muscles were a source of energy during their activity, in 40 and 68 Mc bands for the forearm flexors and extensors. We found also other harmonic frequencies. The muscles showed noticeable changes in their tension, tonus and electromyograms, under the influence of the very high frequencies in these bands. The dowsing rod reacted upward or downward, in accordance with the dominant tonicization. In this way we were able to find the connecting link between the muscles holding the dowsing rod, and the dowser's environment. When the dowser grasps the rod, considerable tonicization of the forearm muscles occurs, and these generate an extensive electromagnetic field in the form of a dipole. This field is distributed about the forearm's tonicized muscles in the same way as about a transmitting antenna (Fig. 4b).

The existence of this electromagnetic field can best be proven by biomonitoring with a dowsing rod or biopendulum (sideric pendulum), and by the change in the recipient's muscle tension. With the change that the presence of various materials cause in the dielectric properties of the energy field of the muscles holding the dowsing rod or biopendulum, and with the reflection of the vhf waves, the tonus of the muscles holding the dowsing rod is altered, and the dowsing rod moves until it assumes a new equilibrium position. When forced into an unsteady position, sometimes the dowsing rod swings around. That this is actually a reaction to an own vhf source has been proven in various isolation experiments with the filtration, shielding and reflection of the muscles' energy field. When the muscles are tonicized by a strong dowsing rod, the range of the energy field is considerable and extends to a distance of several hundred meters, as we found in experiments in which the dowsing

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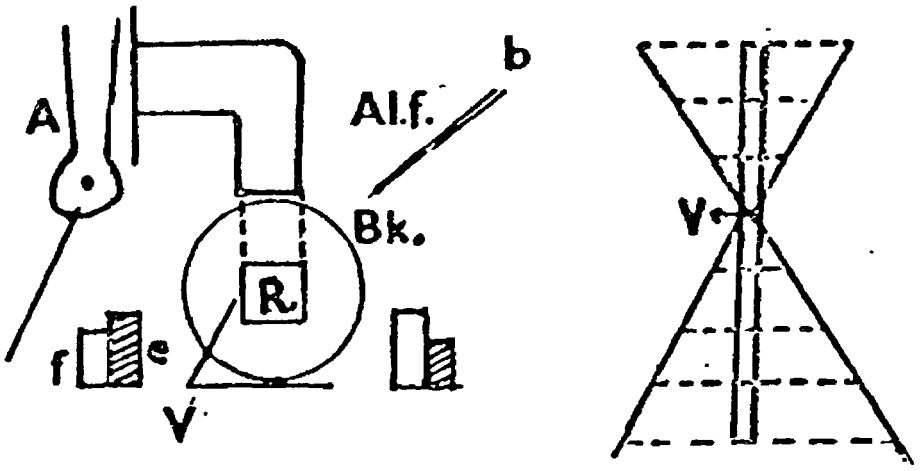


Figure 4. a. Myotransfer and a waveguide (A - agent, f - flexors, e - extensors, R - recipient, V - dowsing rod, Bk - biopendulum, Al.f. - aluminum foil).
b. Dowsing rod's energy field.

rod's reaction was observed in an airplane flying over water. This was confirmed also by the finding of deep underground sources of mineral water with the help of a dowsing rod, for example, at the Podebrady spa.

When seeking water or ore deposits by means of a dowsing rod, possible errors might arise from the mentioned sensitivity of the muscles to vhf waves, to the muscle activity of other persons, to significant changes in ionization, to high-frequency fields and discharges, to x rays, etc. Thus, already solar radiation affects dowsing, directly by electromagnetic waves in the vhf region, and indirectly by ionization with ultraviolet rays. While monitoring the intensity of sunlight by means of a heliograph, we observed deflections of the dowsing rod after sunrise, the maximum occurring at full intensity. These deflections were caused by a change of muscle tension, predominantly in the flexors, and similar changes of tonus occurred also in experimental animals. Shielding with black paper or lumber did not have any effect on the observed changes in muscle tension, nor on the dowsing rod's deflection and the bio-oscillations.

Frontal passages likewise produced varied patterns: activation of the flexors or extensors, parallel with the attenuation of the antagonistic muscle groups; or a decline or rise of tension in both muscle groups, in man as well as in experimental animals. The dowsing rod's deflections and the biopendulum's tracing corresponded to the changes in the tension

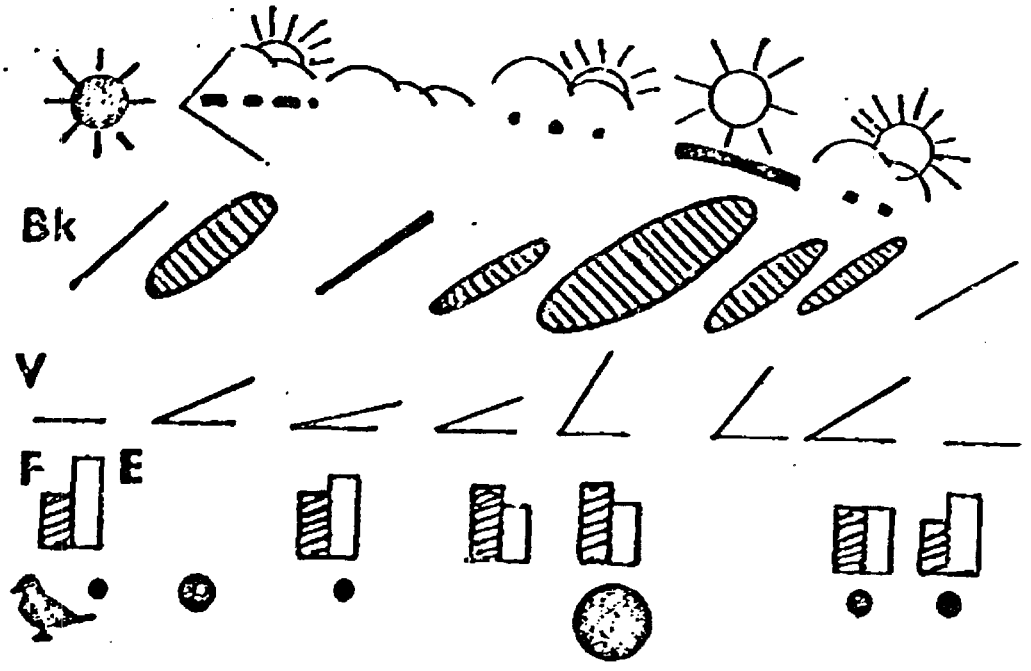


Figure 5. Sun's effect on the dowsing rod.

- Heliogram;
Bk - Biopendulum (sideric pendulum), tracings;
V - Dowsing rod, deflection in degrees;
F - Forearm flexors;
E - Forearm extensors;
- Tonus of a pigeon's pectoral muscles.

of the agonistic and antagonistic muscles, and to the ratio of their tension. An example of a frontal passage is shown in Fig. 6.

The observed changes in weather and in the intensity of sunlight alter the value of the dowsing rod and biopendulum's reactions to water or metal and influence energy intertransfer.

Finally, search for distant and underground sources of water and metal depends also on the proper position of the forearm muscles, because a small angular change in the position of the forearm muscles' dipole causes a substantial error, particularly in the case of water or ore deposits at considerable depth. When excavated to 8 and 10 m, for example, there was no water directly below two sites located by a dowser. When

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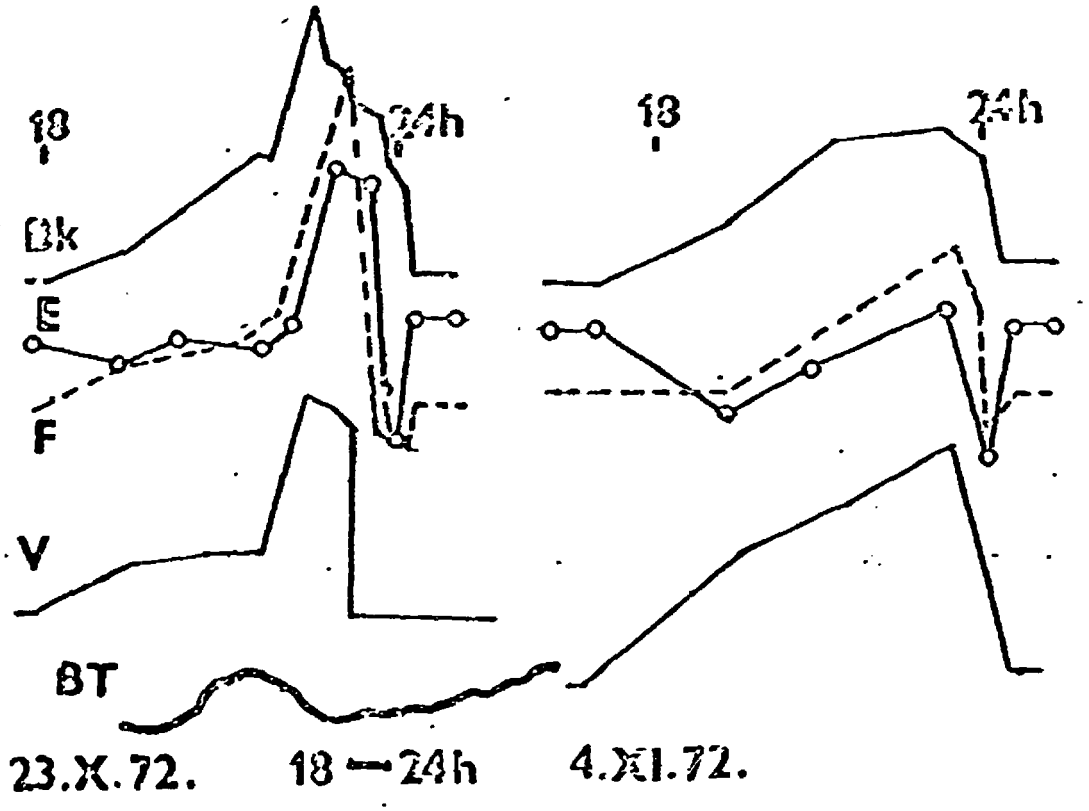


Figure 6. Bk - Biological pendulum;
E - Extensors;
F - Flexors;
V - Dowsing rod;
BT - Barogram recorded on 23 October 1972;
---- Frontal passage.

the muscles' dipole was accurately oriented, we found errors of 1 m and 80 cm from the edge of the underground spring. After determining the depth, we drilled probes into the wall of the well at an angle, and the well filled with water. When seeking an underground source of water by dowsing, therefore, it is advisable to locate the site from several directions, and then to correctly evaluate the edges of the source. Also our experiments with drilling test pipewells were successful. So far as the dowsing rod itself is concerned, neither its shape nor its material is that important. It can be a forked branch, wire or coiled spring, but it must tonicize the muscles sufficiently. We were able to use even an

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air-filled balloon squeezed in the hand. Medieval dowsers sometimes used scissors that indicated water by clicking. We tried scissors, and they worked. For a more accurate determination of the dowsing rod's deflection, we used a gravity goniometer connected to the dowsing rod. Myotensiometry permits the rapid measurement of changes in muscle tension, over springs and metals. By this rapid and objective method it is possible to demonstrate also the differences in sensitivity to water, metals and ferromagnetic materials, caused by changes in neuromuscular irritability, for example, in the case of spasmophilia. It was likewise possible to objectivize the unfavorable effects of permanently residing over underground springs, and to explain these effects as a state of constant high tension or stress, caused by the increased feedback tonicization of the smooth and striated muscles.

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METHOD OF DETERMINING THE DEPTH OF CHALCOPYRITE ORE BODIES

[Paper by Anatoliy Ya. Chekunov, geophysicist, Ufa, USSR, in Russian]

[Text] The biophysical method is successfully solving such important problems as determining the depth of anomalous objects or structures that have been discovered. Figure 1 gives a general idea of how the measurement is made. If an ungrounded conductor is laid on the surface of the earth so that one end is located within the contour of an anomaly detected by the biophysical method, and the other refers to "infinity," then a field is induced in the conductor which has the sign of the anomaly, and this field is recorded by the operator. The field that occurs extends along the conductor to a length equal to the depth of the rim of the object or structure near which the measurement is being made.

In practice the work is done as follows: a spool with any brand of conductor marked every 20 meters is set up within the limits of the anomaly and 5-10 meters from its boundary. The operator loops the end of the conductor about his waist and starts off away from the anomaly into the "normal field." As a rule the operator continues to record the biophysical effect beyond the limits of the known anomaly, since the field induced in the conductor is transmitted to the operator. At a certain distance from the boundary of the anomaly the frame or rod ceases to rotate in the operator's hands. This distance is taken as the depth of the rim of the underground body. These relationships have been obtained experimentally through determination of the depth of chalcopyritic ore bodies at dozens of known deposits and occurrences of ore.

The discrepancies between the depths determined by the biophysical method and by drilling did not exceed 20 percent.

The measured depths were as much as 700 meters. The accuracy of measuring the depth decreases with an increase in the object's angle of dip, the depth, and the intensity of the anomaly.

The phenomenon which is used in determination of depth also has its drawback. If a surface conductor (heavy areas of the locality) overlies the

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ore body and its boundary, then it becomes part of the area of the anomaly determined by the biophysical method, and the depth of the object as determined will be incorrect. False anomalies and distortions can be eliminated by repeating operations in the wintertime and by using a frame or rod that is less sensitive.

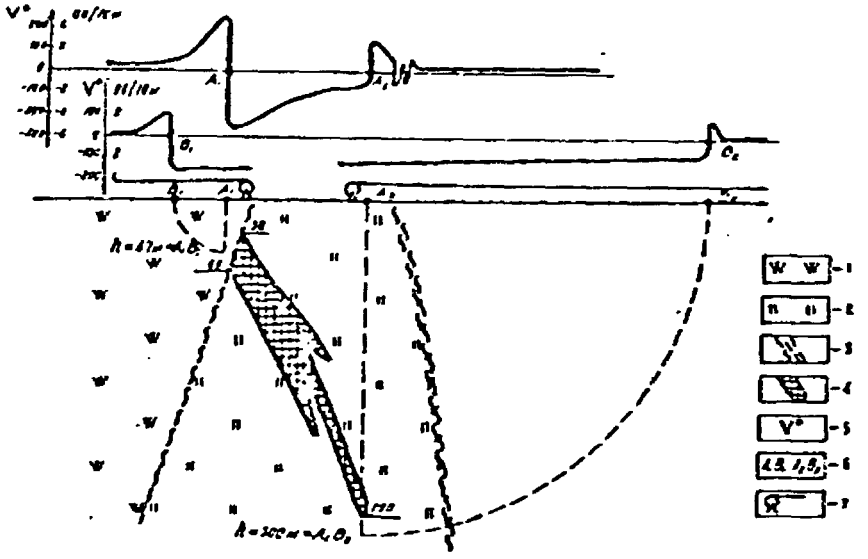


Figure 1. Method of Determining the Depth of the Upper and Lower Edges of an Ore Body of a Chalcopyrite Deposit

Key:
1. Dacitic porphyrites
2. Secondary quartzites
3. Schistous zones, tectonic dislocations
4. Ore body
5. Units of measurement
6. A_1B_1 and A_2B_2 are the segments of the conductor representing the field and equal to the depth of the ore body at the points A_1 and A_2, respectively
7. Spool with conductor

Provisional units of measurement can be introduced to compare different anomalies determined by the biophysical method. One needs for this purpose a standard man-made field where operators and the frames or rods they use can be calibrated. The electrostatic field created by a d-c source in a 10-meter segment of a coaxial cable can be used as a standard field (Figure 2A). Negative anomalies corresponding to conductors occur when the positive source of the current is connected to the central wire and the negative to the shielding.

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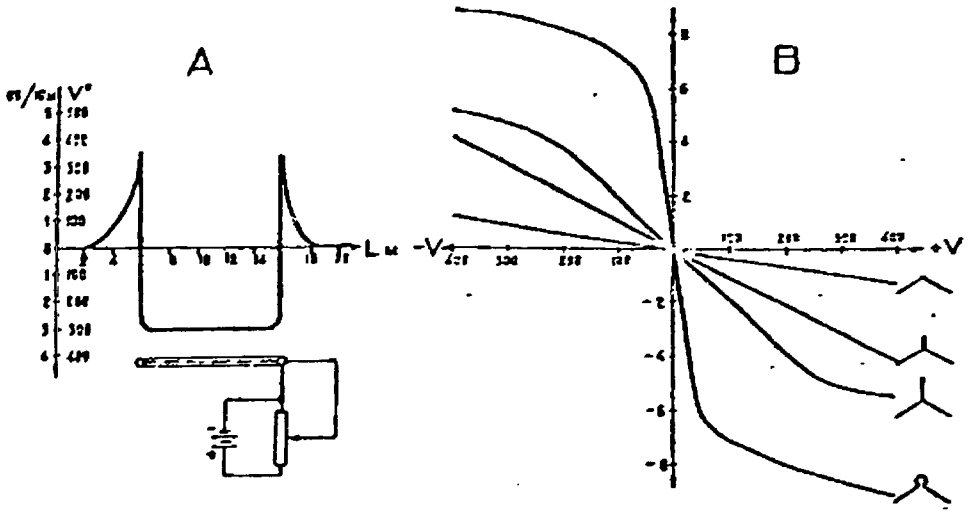


Figure 2. A. Diagram Showing the Setup of a Standard Electrostatic Field With a Coaxial Cable and Graph of the Biophysical Effect Over It
B. Calibration Curves of the Biophysical Effect Over a Charged Coaxial Cable

The graph (Figure 23) shows the dependency of the effect's intensity in rotations over a 10-meter segment for frames of varying design on the magnitude of the voltage applied to the cable. The dependency can, of course, be different when the frames are taken by other operators.

One must take the shadow effect into account in calibration, and the pause between measurements must be increased to eliminate it.

As we see from the graphs, the rate of rotation of certain frames has a limit as the voltage is increased, so that to solve various geological problems one needs to use different frames so that the rectilinear portion of the graph is used.

For the sake of example let us examine the result of observations in relation to a geological cross section (Figure 3).

When the results of drilling are taken into account, one can confidently distinguish the differences of rock and determine the thickness of layers and their slope with an aluminum frame and circuit. The intensity of the frame's rate of rotation is 10-20 provisional units. We note that the rocks in the cross section have differing electrical resistance (determined by electrical logging) and that negative values correspond to low-ohm rocks and positive values to high-ohm rocks. It is obviously impossible to determine the lithology of rocks by the biophysical method. Thus pyroxene-plagioclase porphyrites of differing age occur three times in the

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cross section and the values of the biophysical effect in the western portion of the cross section (drill holes 4 and 5) are positive, in the central portion (drill hole 10) they are negative, and in the eastern portion they are zero. Geological mapping by the biophysical method is apparently possible only if the rocks have differing electrical resistance.

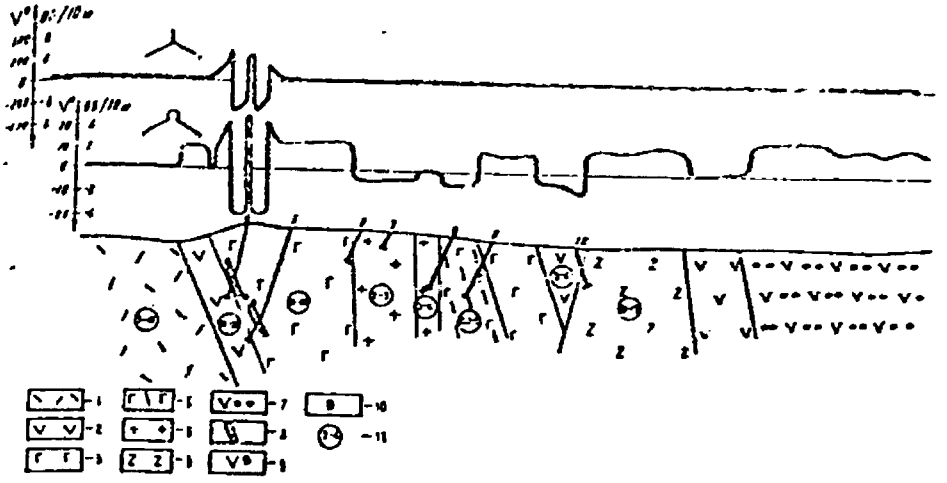


Figure 3. Geological Cross Section With the Results of the Biophysical Method

Key:
1. Albitophyres
2. Pyroxene-plagioclase porphyrites
3. Diabases
4. Tuffites
5. Plagiogranites
6. Gabbrodiorites
7. Volcanic breccia of pyroxene-plagioclase porphyrites
8. Low-ohm zones
9. Provisional unit, rotations over a 10-meter segment
10. Depth of the low-ohm zones determined by the biophysical method
11. Electrical resistance of the rocks in thousands of ohms

The intensity of the anomaly pierced by drill holes 4 and 5 could not be determined in provisional units when a frame with circuit was used.

Observations with a frame whose circuit was shorted were made along the profile. In view of the low intensity of the field under the different rocks (10-20 units), zero values of the biophysical effect were obtained along the profile. An anomalous body was confidently recorded with negative values (150-200 provisional units); its low electrical resistance was confirmed by electrical exploration in a drill hole.

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Taking into account what we have said above, we can hypothesize that the biophysical effect occurs in connection with the organism's interaction with electric fields and that in the field of exploratory geophysics the biophysical method should be included among the methods of electrical prospecting based on study of a natural electric field. This conclusion is confirmed by the shadow effect, by the recording of an electrostatic field whose charge comes from various sources, by determination of the direction of the movement of the current along a conductor and of flowing water, by the extension of a field along a conductor in the determination of depth, etc.

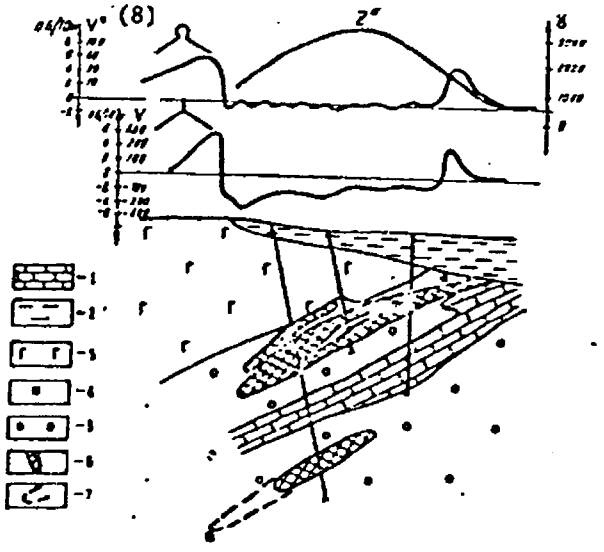


Figure 4. Biophysical Effect Over an Iron Ore Deposit

Key:
1. Limestones
2. Deluvial clays
3. Diabases, diabasic porphyrites
4. Depth of the ore body as determined by the biophysical method
5. Skarns
6. Ore body
7. Contour of the ore body as indicated by the biophysical method
8. Rotations over a 10-meter segment

Nor is the influence of a magnetic field excluded. Figure 4 shows the results of observations at an iron ore deposit. The ore body was confidently distinguished as a negative anomaly by a frame with shorted circuit, and the depth was determined. When a frame with circuit was used, the anomalous effect seemed to be destroyed by the magnetic field; the frame rotated in various directions. Depths are either determined with uncertainty, or they are not determined at all. This phenomenon can be used to shed light on the nature of the anomalous body.

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The information we have presented is not definitive, and the biophysical effect observed in the field of geology will undergo further study in which electronic apparatus will be used and the objective parameters of physical fields will be measured.

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INTERPRETATION OF DOWSING REACTIONS

[Paper by Engr Mirko Kaderavek, Chemical Industry Planning and Design Enterprise, Brno, Czechoslovakia, in Czech]

[Text] Despite indisputable successes, the results of dowsers are still characterized by frequent errors that significantly detract from the reliability of dowsing. Evaluation of the dowsers' detection data fairly often reveals what causes the poor results, in terms of the inaccuracy of location, or of determining the essence of what affected the dowser to produce the known reaction.

If the evaluation is to be thorough, we must exclude at the very beginning all detection results be persons who do not qualify as dowsers on the basis of their long years of successful dowsing activity, or in repeated field tests or special laboratory tests.

For comparing the usefulness of the results and the corresponding reactions, then, the most suitable subjects are highly experienced and reliable dowsers who most often have been successful in detecting underground springs for the purpose of digging wells. Besides this largest group of dowsers, there are also dowsers specializing in detection in karst regions where the reaction stimuli include, in addition to underground water, also dry or flooded underground cavities, frequent faults, fractures or chimneys. Even though it is much more difficult to verify the correctness and accuracy of their results, some of these dowsers have achieved a good level and have gained even foreign recognition, thanks to the fastidious performance of their tasks. All these dowsers may be regarded as empiricists because they start out from their extensive practical activity, and hence from their vast experience.

To these two groups of empiricists we may add another group of persons whose spontaneous dowsing faculty has been established by testing or by a simply repeated experiment that immediately proved to be correct and accurate.

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In view of the fact that the empirical dowsers in the first two groups specialize almost exclusively in finding underground springs or cavities and thus react to stimuli that unambiguously are of a geological nature, it is necessary to concentrate in general on ivestigating the reactions merely to such stimuli, which are termed passive. Passive stimuli are defined as stimuli that neither receive nor emit external energy in any form and actually affect only by their presence, as some pronounced change in the evironment. For consistency in the selection of stimuli, however, we must exclude from among the geological stimuli the cases in which some radioactive element is present or when there are also secondary stimuli such as various metallic objects, live electrical cables, sources of heat radiation, or other stimuli from chemical processes that are taking place.

A very important factor in evaluating the dowsers' reactions seems to be the personal technique of each individual in the two groups of empiricists. Among these empiricists, of course, we must again exclude the ones who do not use a dowsing rod or any other tool, because in principle we want to evaluate the motor demonstration while using a suitable tool that traditionally is called a dowsing or divining rod.

Essentially suitable for comparison and evaluation are all types of two-handed tools used by only one operator, but not a two-rod system in all its variations. The tools that can come into consideration are wooden forks or twigs, similar loops of flexible wire, and possibly other shapes of any material that has the necessary mechanical properties. These include a helically wound cylindrical spring whose turns do not touch when the spring is at rest. This tool can easily be formed by bending. When its two ends are held correctly, the tool assumes its basic working shape that resembles a Greek capital Omega, after which the tool is named.

Every experienced dowser uses predominantly one type of tool, adapting it so that it will suit him best. He is completely accustomed to his tool, and in practice he has checked out in detail how to distinguish a certain stimulus, basing his detection work predominantly on this stimulus. Because it is a known fact that the applicability of the individual types of dowsing rods is fairly limited, some dowsers began to use two or more different types of rods, as needed, and to combine their indicating properties. But the dowsing rods' specific motor demonstration is so similar that differences in its course may be disregarded, and it may be evaluated uniformly as versation or turning. This term covers all basic motions, the direction of deflection, and the rate of motion.

Before the commencement of dowsing, each of the mentioned rods must be brought into its basic working position, in which the rod's plane is pointed always upward or obliquely forward, about the axis of rotation

intersecting the two hands. From this position, which is the initial position for all further motions, the rod turns either downward and away from the dowser, or in the opposite direction, toward the dowser. The rod may describe a full revolution or 360° about the horizontal axis, back to its initial basic position, or it may complete several revolutions, one after the other.

A significant role is played also by the rod's mechanical properties, particularly the employed material's modulus of elasticity, expressed more accurately as the entire rod's modulus of twist. The state of tension is determined by shaping in the working position. This introduces a certain prestress that depends on the rod's dimensions, and also on the force exerted by the dowser's hands. The rod's mechanical properties partially predetermine the course of versation, and thereby also the rod's applicability to a certain method of detection, as well as a certain manipulation peculiar to the rod.

A dowsing rod with a low modulus of twist appears to be more sensitive even to small changes and differences in the effect of the individual stimuli, and thereby provides the maximum attainable recordability. For this reason the spring rod, which can be made with optimal mechanical properties in relation to the other forces acting during versation, has become the most expedient and also the most simple dowsing rod. Specifically for this reason the dowsing rod of the Omega type, used also by professional dowsers, has been the subject of detailed investigation and, because of its versitile applicability, has been selected as the optimal type of two-handed dowsing rod. All studies have dealt with this type of rod.

In view of the mentioned advantages of the Omega dowsing rod, also the third group, that of spontaneous dowsers, was equipped with this type of dowsing rod, because in their case it was unnecessary to take into account their being accustomed to an already proven dowsing rod. In this way we were able to exclude any possible subjective factor from the evaluation.

For a meaningful comparison of the courses of versation it will be expedient to explain some differences in the typical course of versation, by types of dowsing rods. Because these differences are characteristic, they must be taken partially into consideration. The most pronounced difference appears between the Omega dowsing rod and a loop of strong wire, in terms of a basically different type of recorded reactions to the same stimulus. In the zone of the stimulus, the wire loop usually undergoes a versation cycle in which the loop's rotation is commensurate with the number of impulses, until the dowser temporarily loses his sensitivity. But in the case of flexible dowsing rods of the Omega type, whether of wood or spring, the cycle most often is a continuous, single-impulse cycle, with the rod's autostabilization. This cycle is marked by a slower

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and continuous deflection, until the location is found, and there is no loss of the dowser's ability to record continuously the changes in the action of the stimulus. From both cycles it is possible to select individual sections of identical meaning, and thus the two courses of versation in relation to the type of stimulus are easily comparable also as functions of the place and time when traversing a line through the entire zone of the stimulus.

To compare and evaluate the recordings of the dowsers' reactions by versations, we used several different lines along which there were zones of various stimuli, unknown to the dowsers in advance.

The situation was the most simple in the case of spontaneous dowsers who were equipped with dowsing rods of predominantly unfamiliar versational characteristics, most often with one and the same Omega dowsing rod. These dowsers had no knowledge of the type of stimulus, nor of how the rod was able to turn. Thus, their reactions and the dowsing rod's corresponding motor demostrations could not be influenced by any advance knowledge, nor by any subconscious association with some known or inferred course of versation. The recording itself was done by a third person who systematically noted the course of versation along the line, and the dowser himself merely commented on his subjective reactions and sensations.

The empirical dowsers traversed the same lines, but they worked according to their own methods and used their own dowsing rods. Here again a third person recorded the particularly pronounced and unambiguous reactions, to the extent that this was feasible. But parallel with this, the dowsers themselves were required to evaluate their reactions on the basis of their own observations of the dowsing rod's behavior, and to identify and locate the type of stimulus.

Overall comparison of the course of versation as recorded by a third person shows striking agreement in the majority of the cases, for both spontaneous and empirical dowsers. This agreement applies to the points along the traversed line where versation occurred or noticeably changed, as well as to the characteristics of the course of versation at the same points, taking into consideration the two mentioned types of versation cycles by types of dowsing rods, and the methods of detection during traversing.

But when the individual experienced dowsers evaluated their own reactions, the results were very interesting in view of their diversity. There was relatively close agreement on determining the essence of the stimulus in the case of underground springs, where experienced dowsers guaranteed that their findings were correct. But along the line there were recorded also other reactions that most dowsers were unable to define unambiguously. In some instances of versation, the dowsers were completely

puzzled and unable to accurately determine the origin of the reaction. Thus, some dowsers attributed the versations to various effects that ranged from differences in the composition of the rock and underground cavities, to the presence of secondary stimuli such as bones or metallic objects. In isolated instances some dowsers would declare as erroneous or unwarranted the versations that seemed unclear to them, while other dowsers would consider the same cases, with an entirely identical course of versation at the same points, as reactions to entirely specific and routine stimuli.

Thus, when the course of versation was entirely identical for both the spontaneous and the empirical dowsers, there were differences in the evaluations of the individual empiricists. Furthermore, when the course of versation was identical for all spontaneous dowsers, there were some differences in the course of versation in the case of individual empiricists, even though the empirical dowsers were in agreement on identifying the stimulus.

A detailed analysis of all this information can be summed up briefly in the following conclusions:

A. As a motor demonstration of the individual's reactions to various specific stimuli, the course of versation is neither generally uniform nor invariable.

B. The course of versation, however, shows specific deflections that correspond to the type of stimulus inducing the reaction.

C. The course of versation varies in accordance with the dowser's personality, but the mutual relations for different stimuli remain the same regardless of the dowsing rod used.

D. The accuracy and reliability of versation depend merely on the ability and competence of the dowser himself, in accordance with his psychic state and perhaps also with his physical condition.

The specific deflections under (B) and (C) manifest themselves primarily in the value of the angular velocity at which the dowsing rod deflects from any position, and in the value of the angle of deflection as a function of the point traversed along the line, this angle being measured from the dowsing rod's basic working position, i.e., its vertical position. These deflections include also the direction of the dowsing rod's rotation, designated as negative when the dowsing rod turns toward the dowser, and positive when it turns away from him. These deflections, of course, always apply to a straight line traversed through the contoured zone of the stimulus, which means that the dowser's median plane is identical with the gradient plane of the stimulus zone.

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The investigated and evaluated deflections do not include the intensity of the deflecting impulse, because it is easy to demonstrate that the value of this impulse depends on the dowsing rod's stabilizing prestress. The intensity of the impulse is essentially commensurate with the quantity of the stimulus, but at the same time it is also a certain special relationship that is a function of the quality of the stimulus' material essence. Thus it is impossible to reliably evaluate the acceleration of the impulse-triggered versation from the initial position.

First of all a detailed comparison was made of the course of versation when the empiricists detected an underground spring, with the spontaneous dowsers' course of versation confirmed by a demonstrable occurrence of an underground spring. The result of the comparison confirms conclusion (B) in the sense that this specific stimulus has a certain characteristic and essentially identical course of versation, even along any perpendicularly traversed line.

On the basis of this first conclusion, it is necessary to gradually verify whether in the case of another, different course of versation the stimuli identified by the empiricists are correct or can be attributed to other impulses; and furthermore, whether the cases in wich the versations differ but there is agreement on the identification of the stimulus are merely individual variations in recording, pursuant to conclusion (C).

Much more important, however, was the finding that a certain versation for a spontaneous dowser agreed with the course of versation for an empirical dowser, although the empiricist himself regarded the versation as erroneous or was unable to explain it, yet this versation corresponded to an entirely specific stimulus, one that was unusual or unfamiliar to the empiricist. From this finding it follows that the encountered versations can be attributed accurately to specific, unambiguous stimuli, although they had not been expected at the point in question and also the spontaneous dowsers had not experienced them previously. This confirms simultaneously conclusions (A) and (B) in the sense that the course of a specific versation becomes constant and invariable for each individual corresponding stimulus. Hence it is necessary to accurately evaluate the individual characteristic courses of versation, so as to ensure the reliable detection and identification of the stimuli by properly assigning them to the recording of the dowser's reactions, called also the destination of the stimuli. This concept includes the distinguishing of the types of stimuli on the basis of an evaluation of the dowsing rod's versation, but also a more detailed classification with the help of another suitable detection method, with special attention to determining the location and depth of the stimulus.

Further analysis shows that inaccuracies may actually arise in the interpretation of more-complex courses of versation, particularly in the case of stimuli whose courses of versation are partially similar, or in

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cases when the zones of action of two or more stimuli overlap. Such similarity, or rather analogy, of the course of versation sometimes leads also to errors in detecting a stimulus, either when the reaction is recorded incorrectly or inaccurately due to the unsuitability of the traversed line in relation to the zone of the stimulus, or when an unsuitable detection method or detection procedure, or an unsuitable dowsing rod is chosen. Errors may arise in other instances also as a result of mistakes in the interpretation of otherwise correct and accurate versations.

The mentioned shortcomings may completely obliterate in the individual versations the fine deflections by which it is possible to distinguish, say, an ore vein from a buried water pipe, a mineral vein from the boundary of strongly different rocks or from a pronounced geological fault. When the recording procedure during detection is inconsistent, even an easily distinguishable underground spring can be confused with the stimulus of a vertical fault or flooded cavity whose courses of versation are similar, or even with a horizontally bedded ore vein.

The need for recording the reactions accurately and in detail becomes even more pronounced on terrain where the zones of the stimuli overlap. When the stimuli are of the same type, then the problem is mostly the accurate location of each stimulus, particularly through the selection of suitable traverse lines. Interpretation becomes far more demanding when the zones of different types of stimuli overlap, giving combinations of different courses of versation, in accordance with the momentary point of detection. Correct differentiation and location are the most difficult on terrain where the contoured zones of the stimuli lie one above the other, for example, where underground springs intersect at different levels or where there are karst formations on several levels.

Thus, even serious cases may arise if the properly recorded reactions are interpreted hastily, especially when the corresponding versations are entirely new even to an empirical dowser and he attempts to conceal his uncertainty in distinguishing them. Spntaneous dowsers likewise may fall in this situation if the given versation has not been verified by them before, or if they rely too much on their own conclusions and on versations already familiar to them. And then there are also the painful scenes when a very sensitive dowser fails to adequately familiarize himself with the entire problem and convinces someone that a new settlement, according to the dowser's reactions, is undermined by an entire network of underground passages, merely because he did not take into account the various extensive utility networks, not to mention other possible geological stimuli.

Assuming that he has a good knowledge of specific versations associated with the corresponding stimuli, a capable dowser is able to detect any

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specific stimulus on the basis of the following scale of the principal groups of passive stimuli, in which certain stimuli always have common versational characteristics:

1. Water stimuli such as underground springs, reservoirs or horizons -- for hydrogeological applications;

2. Underground cavities such as hollows, caves, cellars, drifts or tunnels -- for geological and speleological applications;

3. Dislocations of strata such as faults with displacements of rock strata, fractures or chimneys -- for geological applications;

4. Rock boundaries such as contacts of clearly different rocks, mineral veins, mineral beds, or occurrences of crystalline minerals -- for geological applications;

5. Occurrences of ores such as ore veins or ore beds -- for geological applications;

6. Distructions of the terrain such as excavations, foundations, secondary fills, graves, etc. -- for archeological applications;

7. Secondary stimuli such as objects of metal or of other reaction-inducing materials -- for routine detection and for archeological applications.

From this listing of detection examples it is evident that always some pronounced geological departure from the steady state is involved, or merely a disruption of homogeneity in the upper strata of the earth's crust. However, all these examples can be regarded more or less as changes of the geophysical parameters that perhaps can be recorded also with suitable instruments at the given site. But this does not mean that we must consider these stimuli as physical factors that influence the dowser through a change of the geophysical factors within the range of their zone and induce in him a so-called biophysical effect.

The practical application of this interpretation of dowsing rod versations to detect unknown stimuli lies in that in the course of detection anywhere in the field it is possible to employ a spontaneous dowser whose objective results can be used to define the deformation and contour zones, and to determine the type of stimuli and perhaps also their location on the terrain. The selected terrain in its turn can be traversed at any time by another dowser, to check the results of the preceding one. And then the sought stimulus can be refined through more-detailed detection to determine the depth, approximate expansion, flow rate, quality, etc. of the underground spring.

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The presented scale of groups of stimuli, of course, does not mean a complete and perfect classification and identification of stimuli from ore and mineral occurrences such as coal, petroleum, and certain mineral raw materials. To distinguish in greater detail what the material is in terms of its chemical composition, it is necessary to resort to further, more-detailed destination methods that are known as elemental selection. In distinction from the method of routine destination detection in which versation occurs in a single-impulse, continuous cycle, for elemental selection it is necessary to use a desensitized cycle with multiple rotations of the dowsing rod, where the number of revolutions or the total angle of versation is a guide for determining the composition of the stimulus. Even better is a more-complicated method that employs a selector with a wire loop, but this would already exceed the framework of our study.

To round out our discussion of the reactions' interpretation, then, to the seven basic groups of geological and secondary stimuli we must add elemental selection as the eighth group. We must likewise add a ninth group, that of the active stimuli which in the introduction we excluded so as to simplify our discussion. In terms of their essence, however, these active stimuli overlap with the geological stimuli, in the form of radon emanation or radiation from the decay of radioactive elements in the ores. Into this group belongs also the action of all physical fields, penetrating radiations, and electromagnetic waves of very high frequency. Each of these active stimuli has a corresponding, specific course of versation.

As a separate tenth group we might mention biological stimuli. In view of its diversity and complexity, this group remains a separate domain because here, regarding the essence of the biophysical effect, we must allow hypotheses also other than the ones based purely on physics, but this cannot be excluded entirely even in the case of routine geological stimuli.

The ten basic groups of stimuli listed above actually exhaust the universal dowser's entire detection range, and successful interpretation of any specific versations satisfies all the requirements placed on the dowsers. There remains merely the question of the individual dowsers' reliability and soundness, so that their conclusions may be objective and thorough, parallel with the maximum accuracy and quality of their results.

There is an obvious need to provide for dowsers, especially the new and younger ones not encumbered by various habits and traditions, an instruction manual with illustrations of the versations during the detection of the most common types of stimuli. Such a manual could serve them as a guide to interpret their reactions and to corroborate their own detection methods, until they gain self-asurance and routine through experience.

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Use of the manual in training additional operators would likewise provide more-extensive verification than what is now available in view of the declining number of dowsers. At the same time, it would be possible to determine the extent to which the individual versations are usable, and how they could be corrected on the basis of statistically evaluated extensive results, which of course would be thoroughly checked through findings or by other objective methods.

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CHARACTERISTICS OF BIOPHYSICAL ANOMALIES (BFA) OVER VARIOUS BODIES

[Paper by Vladimir Georgiyevich Prokhorov, candidate of geological-mineralogical sciences, Krasnoyarsk, USSR, in Russian]

[Text] Annotation

An analysis of the character of BFA's obtained when biophysical explorations were conducted in areas of development of pyrite and cobalt-arsenide deposits makes it possible to distinguish certain procedures that help in examining and interpreting the anomalies. The author of this paper noted a + BFA over bodies possessing a higher electrical conductivity than the background and a - BFA over bodies with a lower electrical conductivity. In a number of cases the depth of the perturbing body and the angle of its dip could be estimated according to the character of the BFA. Biophysical prospecting conducted in combination with the data of geology, geochemistry, and geophysics can be successfully used to guide exploration and prospecting.

One of the reasons for the difficulties encountered by introduction of the biophysical method of exploration into geological practice is the lack of reliable criteria describing the anomalies that occur over different bodies. These difficulties have been diminished with the introduction of the quantitative evaluation of the intensity of anomalies with respect to the number of rotations of the frame per unit distance, proposed by N. N. Sochevanov (1971), but they have not altogether vanished, since there is still no standard for determining the operator's sensitivity. It has been established from the data in the literature (which until recently, unfortunately, were extremely limited) and oral communications that the level of intensity of the BFA over similar bodies may differ sharply for different operators, and frequently it is impossible to establish whether the number of rotations of the frame over the body indicates the actual intensity of the field accompanying the body or indicates the individual peculiarities of the operator.

The lack of a theory that satisfactorily explains the cause for the occurrence of the biophysical effect [BFE] makes it difficult to develop a method

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of comparing the sensitivity of operators, which also does not remain constant with the passage of time (Sochevanov, Kapechauskas, Bogolyubov, Voroshilov, Gorbunov, 1971). According to our observations, in comparing classification and interpretation it is more efficacious to use the forms and relationships of areas of individual elements of anomalies plotted according to the same principle. When applied to anomalies such an attempt is presented below in application to anomalies discovered during incidental conduct of biophysical exploration at certain ore fields containing pyrite and cobalt-arsenide deposits.

The BFA was detected with a U-shaped frame [dimensions illegible] of galvanized iron wire carried in both hands. The axis of rotation of the frame was horizontal. The procedure was as follows in areas with desert relief distinguished by good visibility. The operator with the frame followed a previously marked profile at a rate of about 5 km/hr and he was followed by a worker with a bunch of long strips of red and white cloth with which he marked the course. The pass begins with the frame established in a horizontal direction and pointing away from the operator. Rotation of the frame in the operator's direction was taken as positive as the operator moved from south to north. When he moved in the opposite direction, the frame rotates in the opposite direction with respect to the operator, and therefore the sign of the anomaly is reversed. In order to avoid mistakes while the pass is being made, the signs are later changed in the log.

As the pass along the profile is made, a rotation of the frame in the operator's direction is always taken as positive (Figure 1a).

Only full rotations of the frame are recorded. Smaller vibrations are not recorded. When the frame makes a full rotation in his direction (+), the operator says "plus," and the worker following him leaves a red "marker" at that place; a white "marker" is left for a minus sign. A metal washer or other flat piece of metal is attached at one end of every marker to prevent the wind from moving the cloth markers. After every profile has been traversed without stopping, the operator goes over it in the opposite direction. This time he has in his hands the field log and a geologist's hammer. On the return trip a record is made of geological documentation, geochemical testing of rocks and the soil layer, and sections of the route where BFA's have been detected are noted and examined in detail. The worker collects the markers and checks how many there are and their numbers. The author works out in his field book the geological profile, sketches the contours of the anomaly, and draws a preliminary conclusion concerning the nature of the perturbing body. The other method of carrying out biophysical exploration is used in wooded taiga localities, and again it is done along profiles marked in advance. The operator counts the steps between the stakes and tells the worker at which step the frame has made a full rotation (+) or (-). For example: 15+, 17+, 21-.

The observer makes a note in the field book. The operator's movement, when possible, should also be continuous; if the observer is forced to

stop, the frame remains in the same position as at the moment when he stopped. At the end of the route the operator examines the record, changes the signs of rotation if necessary according to the rule adopted, and draws the profile in the scale of 1:2,000 in the field book and plots the contour of the BFA on it. The contour of the anomaly is obtained by the sliding graph method with a step of 10 meters. The signs are summed up by the rules of algebra. Figure 1b.

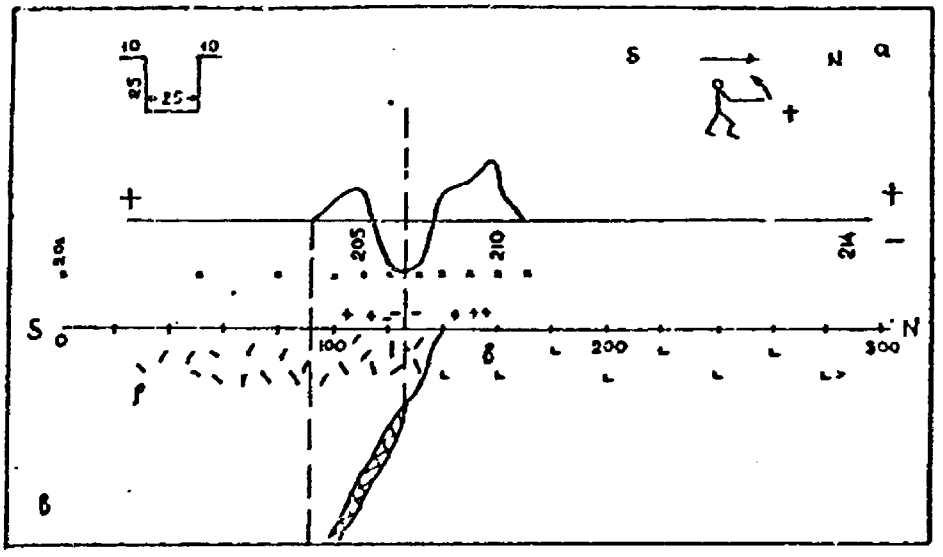


Figure 1a. Shape of the iron frame-indicator and classification of the sign of the BFA adopted in the work.
b. Sample of the field documentation adopted in conducting biophysical exploration in combination with geochemical testing of the profile.

Characteristics of the BFA over pyrite deposits. The area where the work was done was in a taiga locality. In relative terms the elevation did not exceed 150 meters, and in absolute terms it was 400 meters above sea level. A network of small rivers and brooks, frequently running through boggy valleys, was extensively developed. There were practically no outcrops of bedrock, the thickness of loose aluvio-deluvial deposits reached several meters on the slopes of the mountains and more than 10 meters in the valleys. The deposits lie in phyllitized carbonaceous-clay and carbonate-clay schists of the Upper Precambrian. The ore bodies are represented by compact and densely impregnated pyrite ores with an admixture of sphalerite and galenite. The ore bodies and ore-bearing zones extend sublaterally. Individual bodies extend outward and downward up to 100 meters, and they are 20 to 50 meters thick. The oxidation zone goes down 30-40 meters, and along joints it goes down 160 meters or more.

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The specific characteristic of the BFA over individualized pyrite bodies is the existence of the positive maximum enclosed between two negative maxima or "shadows," located to some degree symmetrically with respect to the positive maximum. The area which the positive portion of the anomaly occupies on the graphs usually is larger than the area of the negative values. When the ore bodies are lying at a slant, the anomaly assumes asymmetrical outlines, and the area occupied by the negative anomaly located over the underside increases, while, conversely, the negative anomaly located over the rocks of the top side become smaller in size.

Occurrence of the main ore body or of the zone of subparallel bodies in the top side considerably distorts the configuration of the anomaly's contours. Bodies screened by the principal perturbing body do not disturb the contours of the anomaly. The intensity of the anomalies went as high as 5-10 turns of the frame for a 10-meter interval on the route, and the total number of rotations of the frame reached 20-30 (+) and 5-10 (-). Figure 2a.

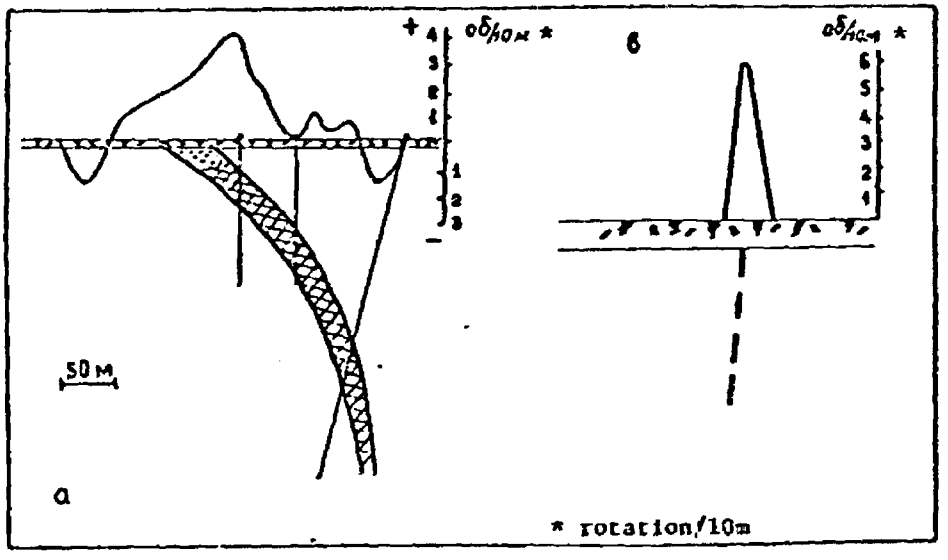


Figure 2a. BFA Over a Pyrite Body.
b. BFA Over a Tectonic Zone With Water.

Anomalies similar in contour occur over zones of dense pyrite compactness. Tectonic zones in this area were recorded as a positive BFA, and the same effect occurs over brooks, when the extreme point of the anomaly frequently does not coincide with the stream bed. The intensity of such anomalies reached 2-5 rotations over a 10-meter interval (Figure 2b).

BFA's over quartz-carbonate bodies in the form of veins and lenses with arsenide-cobalt mineralization were studied at deposits and ore occurrences

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lying in a contact between serpentinites and quartz diorites and also between serpentinites and rhyolites. The growth of the country rock dates from the Middle and Upper Precambrian. The direction of the ore body is sublateral, and the depth of the upper side varied from 0 to 150 meters. The site was located in a broad depression valley, the relative altitude was 100-200 meters, and the absolute altitude above sea level was 1,200-1,500 meters. Over most of the area there are no loose deposits covering the bedrock. There are no year-round water courses. The BFA's over the quartz-carbonate bodies have a complex structure corresponding to the mirror image of anomalies accompanying the pyrite deposits. The central and negative portion of the anomaly, over bodies 10-20 meters thick, is characterized by an intensity up to 5-7 rotations of the frame over a 10-meter interval of the course, with a total number of 20-30 (-) and 10-20 (+) rotations of the frame. Figure 3. Quartz-carbonate veins 1 meter thick were recorded by two or three negative rotations and one or two positive rotations.

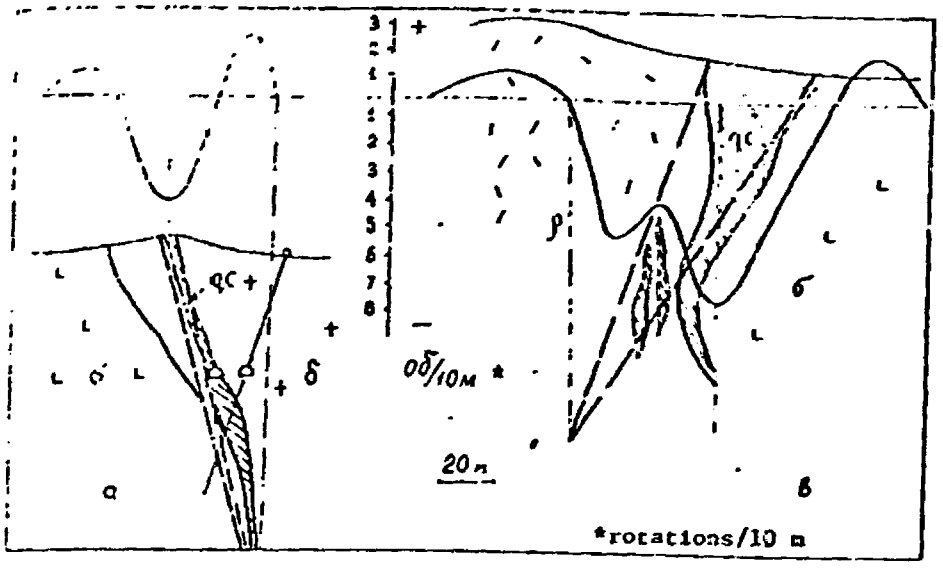


Figure 3. BFA Over Quartz-Carbonate Bodies With Cobalt-Arsenite Mineralization. The shaded portion indicates the position of the perturbing body (ore bodies) forecast; σ--serpentinite; δ--diorite; qc-- bodies of quartz-carbonate composition; ρ--rhyolites.

The presence of arsenide mineralization does not apparently exert any essential influence on the character of the central and negative portion of the anomaly, but it boosts the intensity of the positive anomaly located on the upper side. Figure 3. Veins of purely quartz composition which are widely developed in the region are characterized by negative anomalies with a single peak when the veins contain arsenide mineralization, and

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symmetrically located positive "shadows" also occur when the vein is very thick.

Carbonate rocks of sedimentary origin and making up individual lenses are noted by a positive rotation of the frame with a moderate intensity of 1-2 rotations over a 10-meter interval. No negative "shadows" were observed at anomalies over carbonate rocks.

Below are some methods of interpreting the anomalies.

1. When the perturbing body is lying vertically, the central part of the anomaly has a symmetrical structure.

2. The positive and negative "shadows" accompanying the central anomaly of subvertical bodies lying in monotonous rocks have the same dimensions.

3. The gentler the angle of dip of the perturbing body, the more strongly pronounced is the asymmetry of the anomaly.

4. A "shadow" that is large in size is located over the rocks of the under side.

5. The extreme point of the anomaly is located over the upper end of the ore body, Figure 4a.

6. The extent of the anomaly from the point of the extremum to the end in the direction of the lesser of the "shadows" corresponds to a projection of the ore body on the horizontal plane, Figure 4a.

7. The angle of dip of the perturbing body may be determined from the empirical dependency shown in Figure 4b. The graph shown in that figure compares the degree of the anomaly's asymmetry expressed as the ratio of its areas on both sides of the abscissa of the extreme point to the angle of dip of the perturbing bodies.

8. On the basis of a comparison of the electrical conductivity of rocks and anomalies occurring over them, we can conclude that positive anomalies are typical of objects with a high conductivity and negative anomalies typical of bodies with a low conductivity. The occurrence of anomalies with complex configuration is explained by the successive alternation of such zones, Figure 5b.

9. The unequal size of the "shadows" may result from the unequal degree of hydrothermal alteration of the rocks of the under side and upper side, which causes differences in the degree of mineralization and consequently in electrical conductivity.

The examples of forecasting the position of the perturbing body given in Figures 3a, 3b, and 5a demonstrate the rather good coincidence with the

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actual position of the ore bodies. We should note that the BFA's shown in the cross section (Figures 3a and 5a) were discovered and interpreted before commencement of the drilling and mining operations which reveal here a large cobalt-arsenide deposit. It is obvious in this case that biophysical exploration in combination with geochemistry can guide prospecting work. In the other cases the anomalies were not subject to such unambiguous interpretation; in the cross section of Figure 2a, for example, the large negative shadow correctly indicates the position of the under side of the deposit, but the asymmetry of the central portion of the anomaly indicates the reverse. This example confirms once again the correct evaluation of the BFA was possible only by taking into account the geological structure of the area and by having recourse to the data of geochemistry and geophysics.

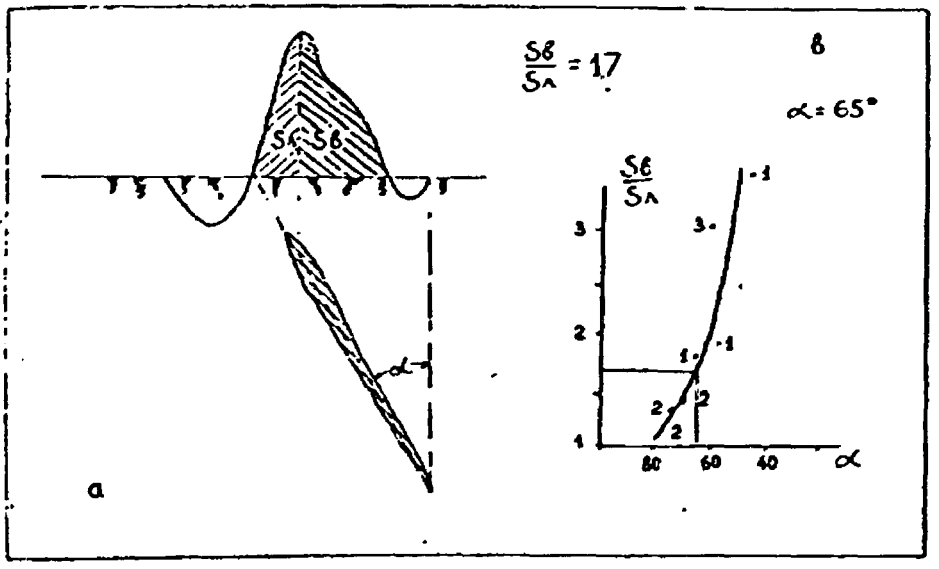


Figure 4a. Diagram of the Relationship Between the Form of the BFA and the Position of the Perturbing Object.
b. Empirical Dependency of the Asymmetry of the BFA on the Angle of Dip of the Perturbing Object.

In conclusion we should note that the methods of interpreting anomalies worked out on the basis of an analysis of one operator's work cannot be simply carried over to the anomalies of other operators. It is obvious that certain elements of the method, especially determination of the angle of dip of the perturbing body, will be determined by different relationships in the case of operators possessing a different sensitivity. If these peculiarities are compared and made known to a broad group of specialists working on the study and use of the biophysical effect, there is

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a good chance of constructing a more universal method of evaluating biophysical anomalies.

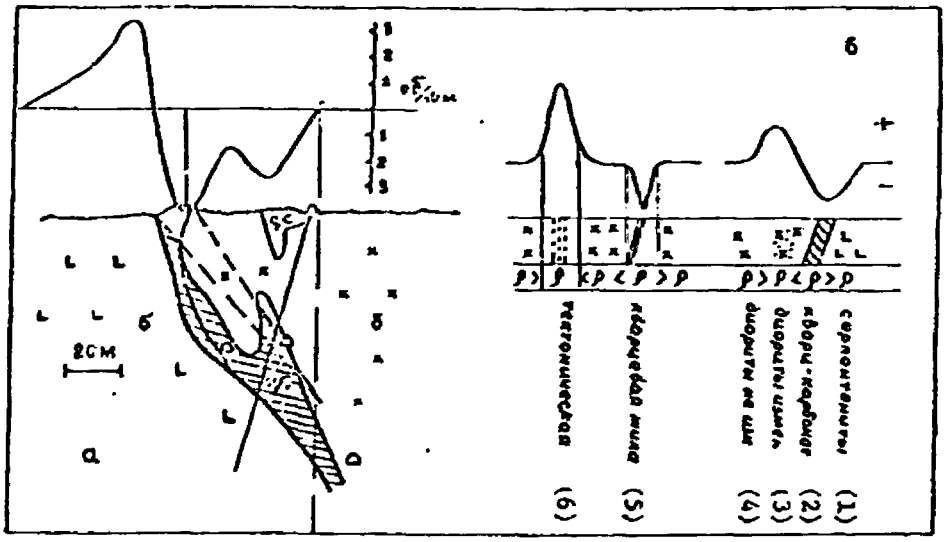


Figure 5a. BFA Over a Quartz-Carbonate Body With Cobalt-Arsenide Mineralization (the key is the same as for Figure 4).

b. Dependency of the Sign of the BFA on the Relationship Between the Electrical Conductivity of the Country Rock and the Perturbing Object.

Key:
1. Serpentinites
2. Quartz-carbonate body
3. Altered diorites
4. Unaltered diorites
5. Quartz vein
6. Tectonic zone

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DOWSING IN THE UNITED STATES: HISTORY, VICISSITUDES, PAST ACHIEVEMENTS AND CURRENT RESEARCH

[Paper by Christopher Bird, trustee, American Society of Dowsers, Danville, Vermont, in English]

[Text] The presentation will cover:

1) The changing attitudes toward dowsing in the United States since the end of World War II and the work of pioneers in stimulating such changes such as Verne Cameron, Henry Gross and others. Circumstances leading up to the formation of the American Society of Dowsers in 1961 and activities of the society.

2) Current research in dowsing in the United States. Topics proposed by the Research and Development Committee directed by Dr Z. V. Harvalik. Topics to be reviewed will include the use of the pendulum in information and map dowsing; testing of dowsing devices; detection of various emanations (radio frequencies, x-rays, gamma rays, etc.); determination of skin resistance and correlation with a dowsing rod signal obtained over a dowsing zone; dowsing signal suppression by various devices; establishment of the sensors that trigger dowsing signals; neutralization of dowsing zones; and others.

3) The relationship of dowsing to other fields of research.

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POSSIBILITIES AND RESULTS OF THE APPLICATION OF BIOPHYSICAL METHODS (BFM) TO THE STUDY AND RESTORATION OF HISTORICAL AND ARCHITECTURAL MONUMENTS

[Paper by Aleksandr Ivanovich Pluzhnikov, docent and candidate of engineering sciences, Moscow, USSR, in Russian]

[Text] The method of seeking underground water and ore based on the natural ability of some people to subconsciously perceive the presence of the geological anomalies they are looking for has been known since ancient times. The biophysical method of seeking underground anomalies (BFM) is being successfully used at the present time by specially trained people (BFM operators) to search for various bodies of natural and man-made origin in the USSR, Czechoslovakia, France, the United States, and other countries.

Since 1970 the author has been using BFM to search for and establish the contours of underground historical and architectural objects with no external indications whatsoever on the surface. The architects N. I. Ivanov, N. N. Sveshnikov, L. K. Rossov, V. A. Mikhaylov, the archaeologist Ye. I. Morev, and others did the research in the historical archives, made an on-the-spot analysis of the zone where the search was made, conducted a topographic survey, and took measurements. The work was done at the request and with the cooperation of the Scientific Methods Council for Preservation of Cultural Monuments of the Ministry of Culture USSR, the All-Russian Society for Protection of Historical and Cultural Monuments, the All-Russian Production Workshop Specialized in Scientific Restoration, the restoration workshops of individual oblasts, and the Central Scientific-Research Museum of Architecture imeni Shusev.

The Method of Biophysical Location

For purposes of biophysical location (BF-location) of underground objects of man-made origin and underground streams of water in an area of architectural monuments we usually use an exploratory instrument in the form of two U-shaped frames (or "double antennae"). The frames are made of steel wire 4 mm in diameter, the antennae are 36 cm long, and the cross piece is 12 cm long. Sometimes one-piece or assembled L-shaped frames (or "single

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antennae") are used, but the end of the older (cross piece) is bent. The principal working instruments are the U-shaped frames as described above, since they possess high sensitivity though they are small in size, allow one to determine the depth of objects, and they are suitable for being carried about every day in the field and in the city.

As the BFM operator moves the frames are held free in the bare hands, and in the initial (neutral) position they must be parallel to one another (with the ends inclined downward several degrees). At moments when the operator is over the anomaly being sought, the frames cross under the influence of the biophysical effect. In the course of BF-location the operator's assistant must mark the boundaries of neutral and anomalous zones obtained with little flags or markers in contrasting colors (for subsequent photography).

Numerous practical searches and certain experiments under varying conditions of the surface and weather (bare earth, grass, asphalt, stone bridge, broken brick, plowed field, and snow; in clear and rainy weather; in the daytime and late in the evening; in hot weather and freezing weather to - 30° C) enabled us to establish that the BFM operator can perform selective BF-location of objects being sought by appropriate tuning to the given type of object. At the present time, in accordance with the practical needs of architectural restoration, we are doing selective BF-location of the following types of underground objects which have no sort of external signs on the surface:

a) hollow anomalies--underground passageways and rooms, heating ducts, burial vaults, communal graves, and former ditches and pits;

b) wooden anomalies--remnants of wooden walls and foundations, stockades, and palisades;

c) stone anomalies--remnants of whitestone and brick walls, pillars, and foundations;

d) water anomalies--drainage systems, underground water courses (those, for example, which threaten building structures).

Objects of considerable extent in a level locality can be BF-located from a truck (preferably with a large body) that is moving at a rate of 10-30 km/hr. Detailed study of the anomaly must be done on foot. It is essential that the BFM operator have a good conception of the physical nature of the anomaly he is seeking and be able to fully concentrate on the search for it, not allowing his attention to be diverted by surrounding circumstances. That is why the following factors have the most adverse influence on the operator's work: cold, damp, and windy weather (the head needs quite good protection against the wind); a state of physical fatigue or bad mood; "kibbitzing" questions and remarks from random observers; hazardous obstacles on the operator's route.

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The correctness of the location and configuration of the objects is usually confirmed by one of the following methods: excavations and physical examination of the remnants of the historical or architectural monument; information of witnesses (including indications of breaks in the arches of underground passageways); comparative analysis of historical documents; and independent surveys of other operators.

Examples of Use of the Biophysical Method

The Site of the Battle of Borodino in 1812. Most of the historical remains of the battle (artillery trenches, infantry retrenchments, "foxholes," palisades, and communal graves) have not been preserved to the present time. Use of the BFM on the Borodino battlefield radically altered the accuracy, speed, and character of explorations for remnants of the battle. An examination was made of Rayevskiy's readout, a very complex fortification whose design is a matter of debate and which was partially rebuilt in the course of the battle; former trenches, palisades, and also a portion of a zone of fortifications of the "foxhole" type were also noted. Detailed examinations were made of most of the former fortifications at other sites of the Borodino battlefield, and a number of communal graves that had been lost were detected (particularly the French graves). Moreover, BFM was used in restoration of the demolished portion of the Kolodskiy Monastery.

Iosifo-Volokolamskiy Monastery (Moskovskaya Oblast), Krutitskiy Castle (Moscow), Fort and Monasteries at Serpukhovo, the Savvino-Storozhevskiy Monastery (Zvenigorod), Fort and Monasteries at Mozhaysk, and the Don Monastery (Moscow). A search was made for former walls and towers of forts, external trenches, underground passageways, former buildings, porches, burial grounds, and also underground water courses, and their contours were established.

Bol'shiye Vyazemy (Moskovskaya Oblast). An investigation was made of the grounds of Tsar Boris Godunov's former homestead. Verification of the historical data (according to Polish sources) by means of the BFM yielded amazing results. The foundations of wooden and stone castles, the wooden walls of the homestead, and all six towers were found. A trench running along the outside breastwork of the walls was found. It turned out that the surviving "leaning" bell tower stands on the site of a passageway of a wooden tower (which has shifted) and partially covers a former trench. (Shouldn't this be investigated as the reason why it leans over so far?) Moreover, the footings of pillars of the passageway from the castle to the surviving church and the footings of portions of the church that had been altogether lost were found. Only about 8 hours of work by the BFM operator were spent in the entire BF-location of the homestead.

Starocherkask (Rostovskaya Oblast). The precise position of the former wooden walls encircling the former capital of Voysk Donskiy (Cherkask) was determined. We made a precise determination of the position of certain turrets of the fortification, and also of certain points of the outside

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fence which had aroused doubts when a design was being drawn up for restoration of this historical complex.

Partial excavations being conducted at all the sites indicated above are confirming the realiability of the results of BF-location.

Conclusions

1. Use of the biophysical method (BFM) in searching for underground anomalies related to the study and restoration of historical and architectural monuments has great scientific importance and application. This method is distinguished by simplicity, speed, and reliability of the indications.

2. BFM is being successfully used in the practical work of the All-Russian Production Workshop Specialized in Scientific Restoration and certain oblast workshops of the same kind. The possibility of selective biophysical location (BF-location) of underground objects (hollow, wooden, stone, and water) under varying conditions of the surface and weather has been proven.

3. To insure the reliability of BF-location preliminary historical and architectural analysis with archive documents and scholarly sources should be made of the site earmarked for BF-location.

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THE ENIGMATIC STATUS OF RADIONICS IN THE UNITED STATES

[Paper by Frances K. Farrelly, Foundation for Study of Consciousness, Philadelphia, Pennsylvania, in English]

[Text] It is paradoxical that radionics which began in the United States should have also died there while in other countries it would appear to have survived.

In the 75 years since the invention by Albert Abrams, M.D., L.L.D. of his ERA device, it has gone through many stages in the United States. From an infantile enthusiastic reception, to a stormy adolescence when it became known as the "black magic box," to its apparent demise at about an age of 65.

Today there is a resurgence of interest in this device; however, the literature is scarce. I propose to report the historical background, the vicissitudes and several unpublished experiments carried on with this device, and to trace the developments and variations of the ERA to include modifications made by Ruth Drown, the Radioclast, Pathoclast, the Heironymus, the De la Warr equipment, and others.

The use of these instruments or devices have been tenaciously ubiquitous, despite scientific indifference and legal complications. Their use, regardless of model, involves a factor of consciousness as does any form of radiesthesia. Radionics belongs in the field of psychotronics and merits conscientious, scientific research. This has never been done; in part due to the manufacturers of such equipment, and the lack of funding for research, publication of often exaggerated material for lay consumption, indifference to seeking the proper avenue of legality, and finally the lack of cooperation from the accepted scientific bodies, who were fearful of their professional status. Now all of that is changing, because parapsychology and psychotronics has become a respectable field of research.

Two small breakthroughs have been evident in the United States. The CONGRESSIONAL RECORD, Vol 117, 17 November 1971, in which the honorable Claude Pepper, House of Representatives delegate from Florida, reported on a paper

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by Stanley R. Dean, M.C., in the November 1971 issue of the AMERICAN JOURNAL OF PSYCHIATRY on the subject "Metapsychiatry and the Ultraconscious" wherein Dr Dean suggested the American Psychiatric Association establish a task force on metapsychiatry to investigate all forms of PSI, including radiesthesia. A paper "Radiesthesia, Radionics and Physics," by William A. Tiller, Ph.D., chairman of the Department of Materials Science, Stanford University, California, given 30 October 1971 before the Academy of Parapsychology and Medicine, has given me the courage to step forward and offer my small contribution of some 30 years of study and research to this workshop.

It is my sincere desire that this enigma of radionics be studied by those well qualified investigators in the field of applied cybernetics, parapsychology, and psychotronics. Radionics appear to have much in common with the phenomena of dowsing, and/or telepathy, and it rightfully belongs to those scientific investigators in both hemispheres to pursue this research further.

I am grateful that this subject has been included in the program of the First International Congress of Parapsychology and Psychotronics.

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THE BIOPHYSICAL EFFECT OF 500 MINERALS

[Paper by Anatoliy Aleksandrovich Malakhov, professor, Sverdlovsk, USSR, in Russian]

[Text] Agricola's data concerning the relation between types of rods and various ores are usually cited in most publications concerning the interaction between the biophysical effect (BFE) and individual elements (and minerals). For example, an iron rod was used only for seeking gold.

The purpose of the present article is to trace the qualitative dependency of the BFE on certain representatives of the mineral kingdom. The minerals used for this purpose were from the author's personal collection, which numbers more than 2,000 specimens belonging to 500 minerals and their varieties. The maximum size of the specimen in this collection does not exceed 3 x 3 x 3 cm. As research has shown, the size of the specimen (under laboratory and display room conditions) does not affect the intensity of the BFE.

The research included an examination of the effect of all these minerals on aluminum and iron indicators. The study was conducted under uniform weather conditions. At the time of the study the atmospheric pressure was 750 mm Hg. The outside temperature was - 13°; room temperature was + 23°. There was no precipitation.

The method of qualitative examination came down to recording the effect of a specimen lying on a laboratory table first on the aluminum indicator and then on the iron indicator. Both indicators had the shape of a stretched loop with sections bent outward at a right angle for the hands. The wire was 1 meter long. The indicator was 41 cm long after being bent in half and taking into account the bent sections of the "rod." The size of the loop (at the end of the indicator) was 7 meters in length and 1.5 cm in width. The wire diameter was 1.8 mm for the aluminum and 1.2 mm for the iron.

Below we present the principal results of the research grouped by classes and certain subclasses of minerals.

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Three groups stand out among the native elements (and also the smelted elements): 1) those affecting both the aluminum and the iron indicators (i.e., the most active); 2) those affecting only the aluminum indicators; and 3) inert (i.e., affecting neither the aluminum nor the iron indicators).

The following belong to the first of these groups: native iron, diamond (including synthetic), platinum, osmiridium, gold, spherulitic graphite, and also the following obtained artificially: titanium, germanium, and silicon.

The second group includes the following: silver, copper, bismuth, and mercury.

The following were inert: sulfur, antimony, and aluminum obtained artificially.

It is a curious fact that native iron from meteorites, such as the Sikho'e-Alin'skiy (which fell 12 [misprint] 1947), pallasite (1886), etc., possessed the same properties.

Fifty minerals of the class of sulfurous and similar compounds were studied. They showed the following patterns: all minerals with the exception of argentite, cinnabar, and kaucherite, reacted to the aluminum indicator. The minerals that reacted, including reactions to the iron indicator, were as follows: realgar, orpiment, molybdenite, kaucherite, galenite, aikinite, and cylindrite. Particular mention should be made of the reaction of kaucherite, which influenced the iron indicator, but did not react to the aluminum indicator. Of all the minerals examined, kaucherite was the only one possessing those properties.

Certain of the sulfurous minerals react weakly to the iron indicator. They include bismuthinite, cobaltine, sylvanite, nagyatite, emplectite, kermesite, boulangerite, and stephanite.

Minerals of meteorites also show the same patterns. Such minerals as troilite and daubreelite react both to the aluminum and iron indicators.

These patterns were also noted for the class of haloids. Halite, sylvite, and carnallite affect the aluminum indicator. Such minerals as fluorite, cryolite, and chiolite are inert.

Not a single mineral of this class reacted to the iron indicator. Rose-colored halite and sylvite reacted very weakly to the iron indicator.

The study included 66 minerals in the class of oxides. With the exception of quartz (and all its varieties), brucite, and nemalite, they almost all reacted to the aluminum indicator. The ones that reacted weakly to the aluminum indicator were valentinite and bismuth ocher. A number of minerals and their varieties within this class also affected the iron

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indicator. They included /balerubin/, ceylonite, chromite, ferrochromite, alumoberesite, magnochromite, hausmannite, wood tin, cassiterite, ilmenorutile, pyrolusite, manganite, /crenvertite/, sassolite.

Those that reacted weakly to the iron indicator are the following: massicot, chrome alum picotite, spinel, chrome picotite, psilomelane, wad, pyrolusite, and asbolan.

We will take up the next largest division of the mineral kingdom--oxy salts--by subdivisions: silicates and other oxy salts. We should note that the following general patterns were observed for this entire division: 1) structural patterns related to the structural type of the crystal lattice; 2) geochemical patterns depending on the position of the leading element in Mendeleyev's periodic table; 3) other patterns, including a relation to the purity or impurity of the mineral (pure varieties are more active than impure ones).

The most active of the silicates are representatives of the subclass with continuous layers of SiO_4 tetrahedrons in crystal structures. We find among them the largest number of minerals affecting both the aluminum and the iron indicators. They include the following minerals and their varieties: biotite, /barbotine/, /dyphanite/, phlogopite, margarite, xanthophyllite, valuevite, penninite, clinochlore, leuchtenbergite, kotschubeite, thuringite, vermiculite, chlorite, and also revdinskite and /aidyrlite/. Other representatives of the minerals of this subclass affect the aluminum indicator. We will indicate the following of these: muscovite, paragonite, lithia-mica, zinnwaldite, serpentine, garnierite, nepouite, gymnite, /kerolite/, talc, glauconite, volchonskoite, kaolinite, pyrophyllite, nontronite, etc.

The subclass of minerals with unbroken chains of [left blank] tetrahedrons in crystal structures is the least active among the silicates. Most of the minerals in this subclass do not react either to the aluminum or the iron indicators. Among these minerals we will indicate certain representatives of the following groups: pyroxenes (enstatite, hypersthene, pigeonite, hedenbergite, augite, jadeite, aegirine, spodumene, and kunzite), amphiboles (anthophyllite, tremolite, actinolite, and their asbestos-form varieties), and also epidote, prehnite, ilvaite, and so on.

Minerals containing rare elements, especially of the lanthanum group, constitute an exception in this subclass of silicates. They affect both indicators.

In addition, among the minerals of this subclass we will indicate chrysotile asbestos and mountain leather, which react on the aluminum indicator.

The subclass of silicates with unbroken three-dimensional structures consisting of $(SiAl)O_4$ tetrahedrons in crystal structures are just as inactive as the previous subclass. Thus in the large group of feldspars only

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occasionally does one note a very weak reaction on the aluminum indicator, and this occurs only in the case of the transparent varieties like moonstone. Iridescent varieties of labradorite also show a weak reaction with this indicator. Minerals in the groups of sodalite, leucite, and zeolite are altogether inactive.

Only certain of the minerals of this subclass react with the aluminum indicator. They include: cancrinite, sodalite, /vishnevite/, and lazurite. Sometimes one can establish the reason for the effect of an altogether inactive mineral on the aluminum indicator. For instance, sunstone affords a positive reaction to the aluminum indicator because of those glittering little iron scales which make this mineral sparkle.

Minerals of the subclasses of silicates with isolated SiO_4 tetrahedrons and with isolated groups of SiO_4 tetrahedrons in crystal structures react differently on the aluminum and iron indicators. The most active among them (that is, affecting both the aluminum and the iron indicators) are representative of the groups of beryllium, titanite, /rinkolite/, etc. The least activity (that is, complete absence of reaction on the two indicators) are noted for the groups of olivines, topazes, idocrases, etc.

Just as varied activity is noted among minerals of other classes of oxy salts (carbonates, sulfates, chromates, phosphates, borates, etc.). Among them the highest activity (reaction on both the aluminum and iron "rods") is noted for the following groups: borates (ascharite, colemanite, priceite, /inoite/, ulexite, borax, hydroboracite, etc.), tungstates (wolframite, huebnerite), scheelite (scheelite, powellite), etc.

Calcites and dolomites are inactive. But the activity of minerals containing manganese, zinc, lead, and barite is noted among representatives of the carbonates. These minerals affect both indicators. Moreover, all minerals containing copper (malachite, azurite, etc.) affect the aluminum indicator.

Finally, in the large group of minerals belonging to the class of organic compounds, we noted activity only on the aluminum indicator of bitumens, petroleums, ozokerites, coals (highly carbonized), and oil shale. The ambers are inactive. Thus on the basis of an examination of the effect of various minerals on the aluminum and iron indicators, a general pattern emerged, distributing the minerals among three groups: 1) those affecting both indicators (aluminum and iron); 2) those affecting only the aluminum indicator; and 3) inert minerals. Their distribution by classes (and subclasses) is indicated in the table, and an analysis of the table reveals the following general patterns:

a) Strong activity is noted on the part of native minerals, sulfurous minerals, and oxides. Inactive minerals are relatively rare among the minerals of these classes.

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b) Among the silicates we note a dependency of activity on the structural peculiarities of the crystal skeleton of the minerals. This is particularly emphasized for two extreme subclasses: those with unbroken layers of SiO_4 tetrahedrons in crystal structures (particularly active) and with unbroken chains of SiO_4 tetrahedrons (and also those with unbroken three-dimensional shells of $(SiAl)O_4$ tetrahedrons (particularly inactive).

c) We note a similar pattern among the minerals of meteorites. Among them the native elements are active; minerals of stone meteorites are inactive.

Among the other patterns we might emphasize the connection between the activity of minerals and geochemical and certain geological factors (processes).

We discovered a cause-and-effect relationship between the activity of the biophysical effect and the element's (leading element's) position in Mendeleyev's periodic table. For instance, the activity already noted for groups [illegible] was also noted in certain other elements. For example, all minerals containing copper and silver affect only the aluminum indicator. When such minerals contain manganese and chrome, they vigorously affect both indicators.

Absorption of the activity by certain elements was noted. For example: pure silicon affects both indicators. A compound containing silicon and oxygen (quartz) is absolutely inactive.

As for the geological processes, we note the role of metamorphism in increasing the vigor of minerals in causing the biophysical effect. This can be traced with particular distinctiveness in one of the groups of organic compounds. Peat, for instance, is inactive; brown coal is slightly active. Bituminous coal and anthracite react on the aluminum indicator. Graphite affects both the iron and the aluminum indicators.

The purity of the mineral aggregates is related to geological processes. Pure minerals have a higher activity than impure ones.

We should note in conclusion that the material presented affords only a certain idea of the activity of minerals with two types of indicators. Work along this line is far from complete.

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METHODS OF SEARCHING FOR UNDERGROUND WATER, BURIED AND SURFACE METALLIC OBJECTS, AND UNDERGROUND VAULTS WITH AN OSCILLATING CIRCUIT OF THE CLOSED TYPE

[Paper by Ivan Pavlovich Inyutin, graduate mining engineer, Chelyabinsk, USSR, in Russian]

[Text] In the SMU-2 [Construction and Assembly Administration] of the Chelyabvodstroy [Chelyabinsk Hydraulic Engineering] Trust and Yuzhuralgiprovodkhoz [Southern Ural Institute for Design of Installations for Water Supply, Drainage, and Irrigation] a divining rod for ore prospecting in the form of a bent metallic rod was used in the winter of 1967-1968 to choose points for sinking water wells. The principal reason for using the ore-prospecting divining rod for these purposes was the increase in the number of wells without water in rayons of Chelyabinskaya Oblast which are promising for underground water. Since electrical prospecting could not be done in the wintertime and is not very reliable in rocks with low mineralization or carbon content, a cheaper method of prospecting whose equipment could be carried more easily had to be used. In a variety of rocks the divining rod for ore prospecting, combined with the hydrogeological documentation concerning the areas prospected, yielded 100 wells with a depth from 40 to 140 meters, and only 10 of these wells lacked water. But in the wintertime the loop of the metallic rod which the operator holds in his two hands is a very awkward design that is difficult to carry, particularly when he is moving through broken terrain.

Development of a new and easier-to-carry design began in April 1969; it is a frame closed by a capacitor that has a trapezoidal or rectangular shape adapted for one-hand operation.

The U-shaped and L-shaped divining rods used throughout the world represent a simplified type of collapsible-whip antenna adapted for one-hand operation. In 1963 V. V. Bondarev tried connecting it to the frame of capacitors during two-hand operation at polymetallic and gold deposits in Central Asia. He noted that the biophysical effect was weakened or intensified when capacitors of varying capacitances were attached to the frame. Similar tests were conducted in 1968 in Moscow by N. N. Sochevanov and

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Yu. G. Kosovets, From the standpoint of radio engineering all designs of the ore-prospecting rod now in existence can be viewed as an oscillating circuit. They can be divided into four types depending on the manner in which the operator is connected to the oscillating circuit:

1. Devices with an open type of oscillating circuit, in which the inductance is the U-shaped and L-shaped frame, and the operator's body is used as the capacitance. The quality of this circuit is extremely low and inconstant, as indeed is the capacitance of the human body.

2. Devices with a semiclosed type of oscillating circuit in which the loop of a metallic rod, the U-shaped frame, or a freshly cut tree branch serves as the inductance, while the human body is used as the capacitance (Figures 1 and 2). Operation is unstable because of the inconstancy of the magnitude of the capacitance. Moreover, as the branch dries out it loses its inductive properties, and the "divining rod" ceases to work.

3. Devices with a mixed type of oscillating circuit differ from devices with a semiclosed type of oscillating circuit by the simple attachment of another capacitance in the form of a capacitor placed in parallel to the capacitance of the human body (Figure 3). The quality of a circuit of this type can only improve as the capacitance is increased, and consequently by changing the capacitance one can broaden or narrow the passband; that is, one can record a larger or smaller number of the signals of underground water, metallic objects, and underground vaults. This phenomenon was observed by both Bondarev and N. N. Sochevanov.

4. Devices with a closed type of oscillating circuit in which the perimeter of the frame itself or a coil (several coils) mounted on the frame serves as the inductance, and capacitors, resistors, or semiconductors can be used as the capacitance (Figures 4-6). In this design the operator's hand does not affect the tuning of the circuit and is an energy absorber.

The transition from the ore-prospecting divining rod to an oscillating circuit of the closed type calls for a change in work methods. While the number of turns of the instrument per unit distance is adopted as the unit in quantifying the indications of the ore-prospecting divining rod, the unit of measurement adopted in this case was the time needed for the trapezoidal or rectangular frame to turn relative to one of the sides from the upper vertical position to a lower position measured in seconds or the number of meters or steps the operator takes per turn over the section being investigated. Hydrogeological considerations make it most rational for the operator to move laterally over the section being investigated.

Of the 280 points selected by the author without consideration of hydrogeological conditions 258 of the drilled wells had a good yield, and 22 wells proved to be without water. There was a good flow from 186 of the 200 wells chosen by V. N. Reformatskiy, while 14 wells proved to be without water. Of the 46 wells chosen by V. K. Sych 45 were drilled and gave a

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good yield, while only one proved to be without water. There were cases when the newly selected wells were 50-100 meters away from wells previously drilled that had failed to give water or between them, and the supposition concerning the presence of underground water was always confirmed. In sedimentary pre-Quaternary rocks the depths of the wells ranged from 100 to 140 meters, in metamorphic rocks from 80 to 100 meters, and in eruptive rocks from 60 to 100 meters. In connection with the drilling and operation of an experimental pump studies were conducted to determine the radius and shape of sinkholes and swallowholes, but the data obtained could not be compared with anything because there were no observation wells. That is why the question of the use of oscillating circuits for these purposes remains open. According to the results of drilling and testing wells chosen by means of the oscillating circuit of the closed type, there has been a 4-percent reduction in the number of wells without water by comparison with wells chosen by other methods. The varying percentage of the number of wells without water from operator to operator (8 percent, 7 percent, and 2.2 percent) occurred because two operators used different designs and different tunings of the oscillating circuit in making the selections, while the third used one and the same instrument with strictly fixed tuning.

The following properties of the oscillating circuit of the closed type were established in using the instrument in various areas of Chelyabinskaya Oblast in determining places for sinking water wells in diverse types of rock:

1. Regardless of the design, the tuning of the oscillating circuit to a particular frequency makes it possible to make separate explorations for soft underground water, hard underground water, underground vaults, and underground and surface metallic objects. This completely excludes the simultaneous reaction of the instrument to ores and vaults, to water and vaults; which does take place when the work is done with open, semiclosed, and mixed types of oscillating circuit.

2. When the oscillating circuit is tuned to a particular frequency, the instrument's reaction in exploration for a specific mineral will depend on the material of which the sides of the frame are made, on the material used to coat the sides (the composition of the paint), and on the material of the gloves worn when work with the instrument is done in the wintertime.

3. When leather, woolen, and rubber gloves are worn during work with the instrument, it can be used for exploratory purposes by a considerable number of people who previously did not possess this ability.

4. The oscillating circuit does not indicate surface water of any type or ground water of the "surface water" type connected to the atmosphere.

5. When the frame is short-circuited by replacing the capacitor with a conductor, the effect of rotation is not manifested, and if the capacitor is replaced by an insulator, the instrument may be randomly tuned to any

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of the four possible tunings: for soft water, for underground vaults, for underground metallic objects, or for surface metallic objects.

6. When the frame of the instrument is made of dielectric (wood, textolite, photographic film, etc.), the instrument does not react to any type of outside interference and cannot be used as a prospecting instrument.

7. When the frame is weighted with counterweights and steadied in the vertical position the instrument does not react to any minerals.

8. When the oscillating circuit is used for a long time for exploratory purposes, two periods are observed in the instrument's operation: surface (skin) and ideomotor (muscular). The surface period is characterized by calm and smooth turning of the frame in the hand and is accompanied by a slight perspiration of the skin of the hand at the place where it touches the frame. The ideomotor period is characterized by spasmodic turning of the frame and is accompanied by involuntary twitching of the hand holding the frame. In the ideomotor period the hand strives involuntarily to free itself of the external stimulus represented by the frame and speeds up the frame's turning to the lower position. In most operators the surface period gradually turns into the ideomotor period. In rare cases one encounters people who have only the surface period or only the ideomotor period of work with the instrument.

9. The oscillating circuit is in most cases tuned for the search for a particular mineral by selecting capacitors of the necessary capacitance (preferably with an accuracy of under $\pm$ 1 percent), and this does not depend on the season, the time of the day, the temperature, or the weather, and is constant for a particular area.

10. The tuning of the instrument in prospecting for a particular mineral changes considerably as a function of the geographic location of the area where the work is done. For instance, an oscillating circuit tuned to prospect for soft water in Chelyabinskaya Oblast begins to react to underground and surface metallic objects in Leningradskaya Oblast, and the tuning of the oscillating circuit for soft water in Leningrad changes to underground vaults in Chelyabinsk.

It follows from our discussion that the effect of the ore-prospecting divining rod is physical in nature and is related to the human skin. The divining rod used for ore prospecting consisting of an oscillating circuit of the closed type can be used with sufficient accuracy to prospect for underground water, underground vaults, underground and surface metallic objects, or mineralization.

The oscillating circuit of the closed type can also be used with sufficient accuracy in testing deep and shallow wells for pumping and pressure. The patterns observed in the retuning of the instrument from one mineral to another ought to be studied in greater detail in the future through comparison with magnetic prospecting.

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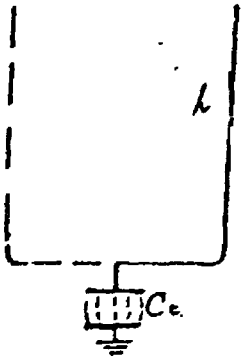


Figure 1

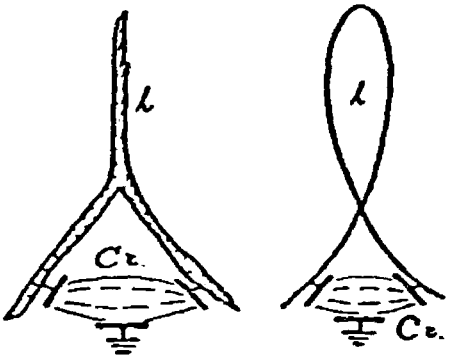


Figure 2

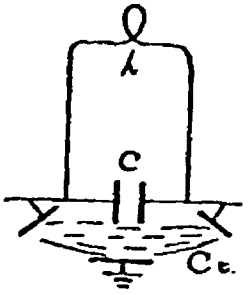


Figure 3

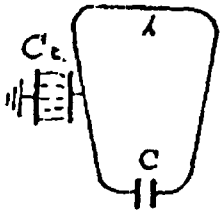


Figure 4

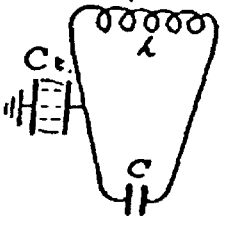


Figure 5

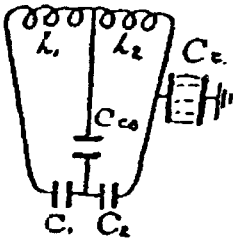


Figure 6

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Use of Oscillating Circuits for Prospecting

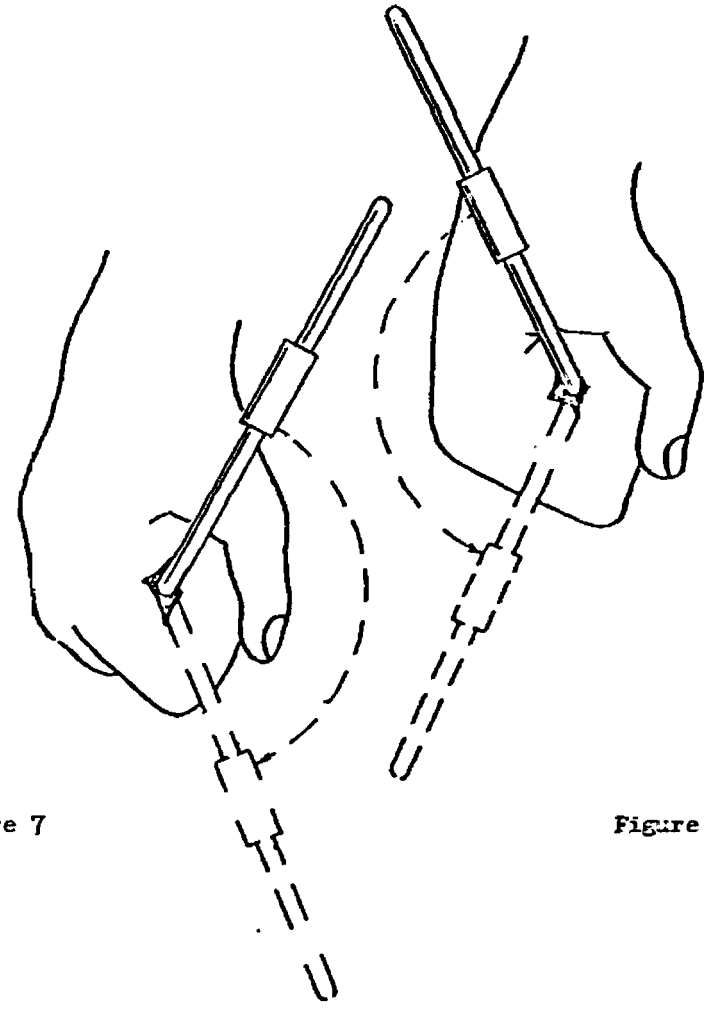


Figure 7

Figure 8

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PSYCHIC AUTOREGULATION AND RESERVE CAPABILITIES OF THE BODY

[Paper by Aleksandr Semenovich Romen, candidate of medical sciences, Alma-Ata, USSR, in Russian]

[Text] Assuming the organism's stable existence, its functions are in a certain relationship with the environment. Accordingly, it is natural that systems (and analyzers) that are carrying a smaller load (or do not participate actively at all in interaction with the environment) are reduced or blocked by others that are more active in a given period, and at the same time they can resume their activity again when necessary (according to the situation). These less active systems and also a certain "reserve" of the actively operating systems make up most of the organism's reserve capabilities, which are an important factor in its existence and activity. Discovery of these reserves has great importance and usually takes place through certain conditioning (imposed, for example, by a vocational program) and under certain extreme conditions. In the latter case the more unusual the conditions, the more likely it is that latent capabilities will manifest themselves. In this case, as we have repeatedly noted in the past, there is good reason to study certain reactions of the organism in a broad range, beginning with the state of heightened emotional tension (caused, for instance, by situational components) in an ordinary situation and including actions under varying extreme conditions on earth and in space (in the state of weightlessness particularly). The research should be conducted along two lines: observation (and recording) of changes in the organism at indicated periods and purposive exposure in order to detect and develop the existing (or assumed) abilities.

Use of psychic autoregulation [PAR] occupies a particular place in the context of what we have said. Investigation of PAR and especially of its principal manifestation--autosuggestion, by demonstrating the depth and range of influence on the organism, at the same time project definite ways of mobilizing and influencing the organism's reserve capabilities. For example, during specialized research we discovered that PAR could exert a deliberate influence on a number of processes in the organism, including those which are not under voluntary control under ordinary conditions (muscular and vascular tonus, sensitivity to pain--in the range from hyperpathy to

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SIMULTANEOUS FUNCTION OF BOTH HEMISPHERES OF THE HUMAN BRAIN

[Paper by V. V. Yefimov, professor, Moscow, USSR, in Russian]

[Text] We know from history that Julius Caeser and Napoleon dictated several letters at the same time, which means that their consciousness was operating in several directions at the same moment and not sequentially, as is usually the case.

At the All-Union Physiology Congress in Yerevan (1966) several papers were presented on the separate and simultaneous activity of both hemispheres of the brain of animals with the callous body connecting the two hemispheres both intact and cut. It was established that only one hemisphere is active both in physical and mental work; by and large it is only the left hemisphere, where Broca's speech center is located, that functions during mental activity. The second hemisphere begins to function at very intense degrees of fatigue or during grave illnesses. The process of writing is done with the right hand or, less frequently, only with the left hand. But when the right hand alone is taught to write, the left hand (that is, the corresponding hemisphere) also learns. If the right hand is wounded or lost, a man easily begins to write a good hand. Consequently there is always communication with the other hemisphere through the callous body.

One can learn to write with both hands by persistent training (at any age). Anyone can very easily move the hands and legs with the same rhythm (concerted movements); it is also easy, i.e., no special training is needed, to simultaneously draw parallel lines or lines vertical to one another with both hands. Even writing one's name in the ordinary way from left to right with the right hand while the left hand writes it from right to left is easy, but it requires long training. However, it is very difficult to draw square with one hand and circles with the other.

Constant training is especially necessary to write one's last name with the right hand while the left hand is writing one's first name. This conditioning quickly deteriorates without practice.

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Simultaneous recording of the electroencephalogram shows a sharp rise in the waves (when both hands are writing).

At the present time the mental work of a manager, commander, engineer, writer, scholar, pilot, or driver requires that he monitor and observe many dials, talk with several visitors, listen to the simultaneous sounds of many regulating instruments, dictate several letters simultaneously, and so on. Adequate training in school would afford the simultaneous and habituated function of both hemispheres of the human brain and would develop capacities of the brain that are still latent.

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THE PRESENCE OF REGULARITY IN THE DISTRIBUTION OF INDICES OF CHEMICAL TESTS DURING DIRECTED, WILLED, EMOTIONAL CONCENTRATION OF A MAN OVER A SHORT DISTANCE

[Paper by T. G. Neeme, Tallin, Estonian SSR, in Russian]

[Text] The writings of Takata, /Bortels/, /Piccardy/, and /Moriyama/ have established that the indices of chemical tests fluctuate over intervals of time. /Bortels/ and /Moriyama/ established the existence of a spatial structure when the tests were conducted simultaneously at a certain distance from one another. /Moriyama/ detected an increase in the irregular scattering of the indices of the tests close to the water.

The existence of regularity in the spatial distribution of indices of chemical tests can be recorded under appropriately selected conditions and under the influence of the willed emotional concentration of a person who is present. Precipitation proceeds more rapidly in solutions exposed to willed emotional concentration. Table 1 and Diagrams 1, 2, and 3 present the results of experiments conducted with four inductors and two control experiments. The regularity of the spatial distribution of the differences in optical transmittancy occurring in experiments 18, 47B, 50, 52, 54, 64, 65, 85, and 116 was considerably higher than the regularity noted by researchers conducting chemical tests. We accomplished a displacement toward intensification or more complete isolation of the phenomenon under study.

Researchers conducting chemical tests believe that the space-time changes in chemical tests are caused by weak influences of the environment. An increase in the rate of precipitation of aqueous suspensions under the influence of psychotronic energy has been noted by Pavlita.

The existence of a spatial structure of the lines of force of psychotronic energy has been demonstrated by Krmesskiy in his writings. Our data show that regularity in the distribution of the indices of chemical tests occurs when brief willed emotional concentration is aimed from a short distance.

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Experiment No	Commencement of Experiment Date	Time	Operator	Distance From Operator's Eyes to Center of Experimental Apparatus, cm	Time of Concentration in Front of Apparatus, min
18	2.03.63	1433	T	45	3
47B	17.04.63	1335	M	40	10
50	13.03.64	2206	T	75	10
52	15.03.64	2112	T	75	10
54	19.03.64	1803	--	--	--
57	21.03.64	0550	--	--	--
64	16.05.64	2025	V	55	26
65	17.05.64	0515	V	55	7
85	15.03.65	1507	T	150	12
116	23.04.66	1817	L	190	3.5

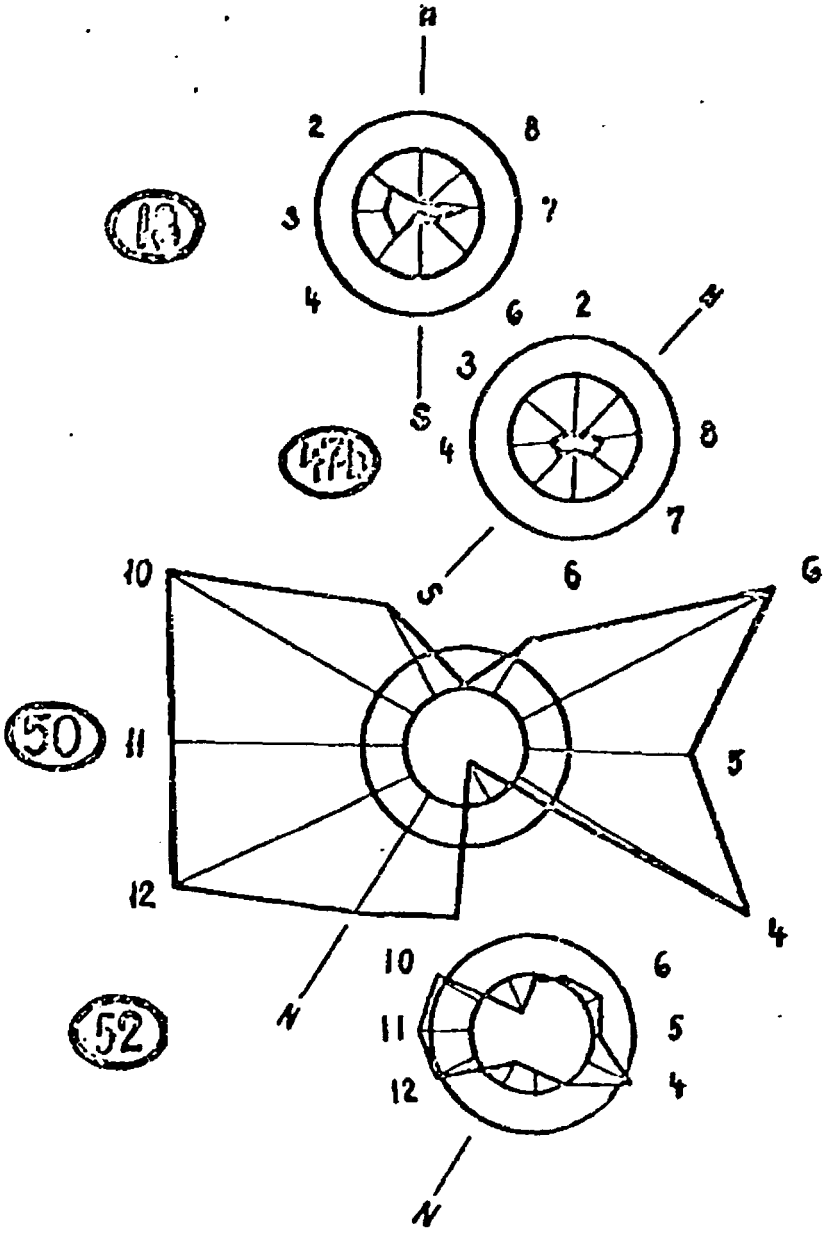
Experiment No	Operator's Position With Respect to Experimental Apparatus and Points of Compass	Rotation of Experimental Apparatus (+, -) (1 rpm)	Limits of Fluctuations of Optical Transmittancy in Different Test Tubes at End of Exposure, %
18	3	-	90.0-85.0
47B	4	-	90.5-88.0*
50	11	+	81.0-45.0
52	11	+	89.5-79.0
54	--	-	86.0-65.0
57	--	-	82.0-51.5
64	4	+	63.5-41.5
65	4	+	64.0-39.5
85	27	+	42.0-32.0
116	16	-	63.0-32.5*

* The result was obtained from repeated measurements.

In Diagrams 1-3 the central vessel containing water used in the experiment is indicated by the inner circle. The outer circle indicates the platform on which were exposed the test tubes of a photoelectrocolorimeter filled with the solution of the chemical test; the horizontal projections are those of the differences in optical transmittancy of the test tubes at the end of the exposure. The number of the experiment, indicating its place in the series, is shown alongside the diagram of the experiment, and it is circled when the willed emotional shock was used. The diameter of the diagram of the experiments and the distance of the experimenter's head from it are in the same scale.

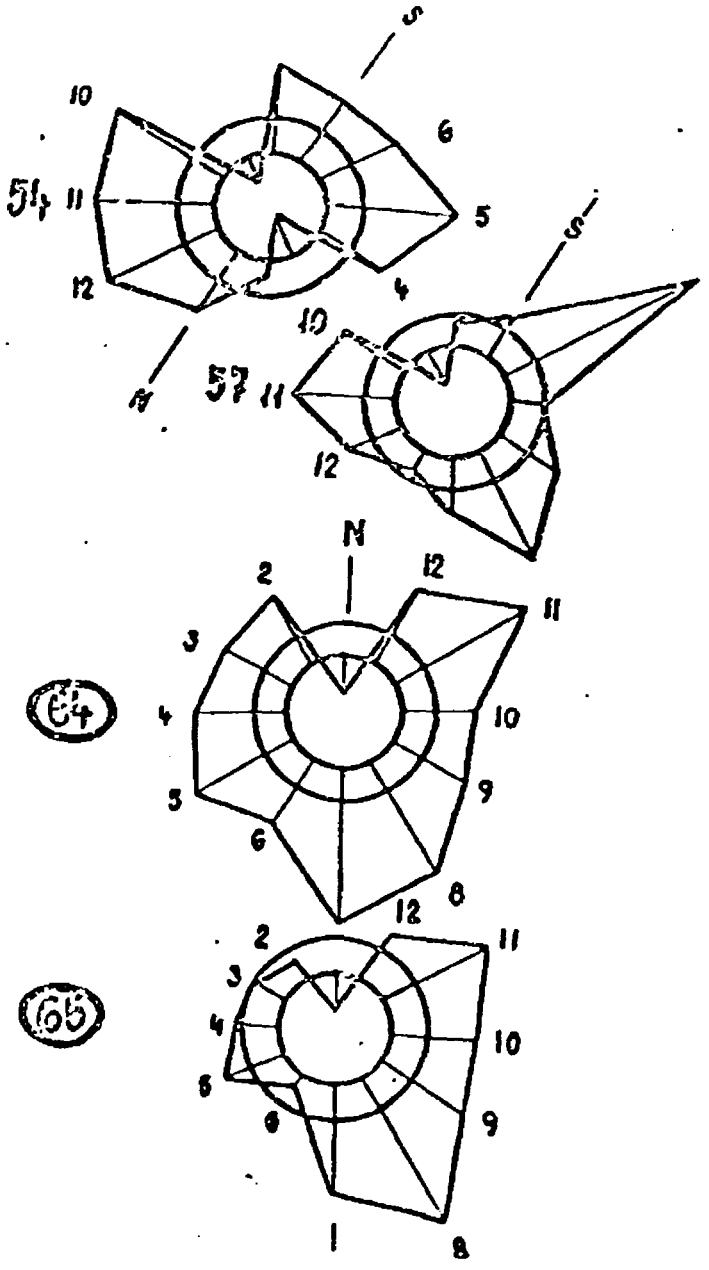
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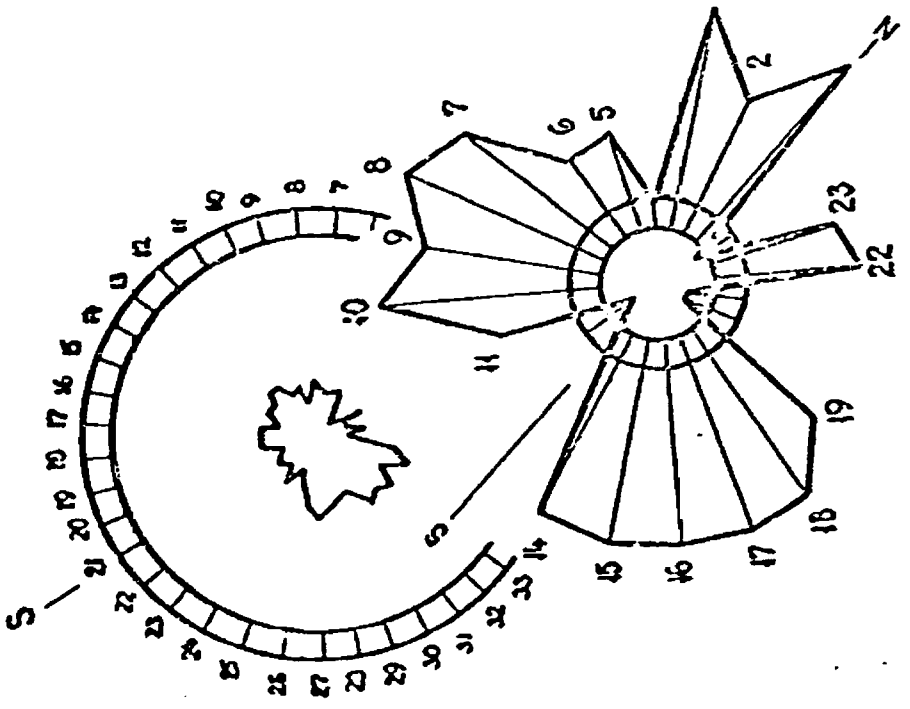
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ELECTRONIC THERAPY

[Paper by Petr T. Goncharov, physician, Leningrad, USSR, in Russian]

[Text] The procedure of bioelectrical stimulation that brings about normalization of the organism's trophic functions is based on the use of electrostatic charges with negative polarity. The mechanism of the physical effect of living tissues is electrical in nature and is related to the higher concentration of electrostatic charges on the therapeutic disk and the direct current with a strength of about $5 \cdot 10^{-8}$ A which is formed in the patient's body and which can be directed at will to the various regions of the organism. Bioelectric energy is formed when the ebonite disk and handle is moved (passed) over the skin of the body. The direction in which the current moves in the circuit is counterclockwise--from the disk to the patient. The patient can either pass the ebonite disk over his body in various directions, or this can be done with the help of someone else if the electric circuit that is formed is closed. Remote exposure is possible at a distance up to 10 meters, or the skin can be electrized by contact with the disk or ebonite plate that is held on with tape.

Research has shown that the electric current passing through the patient's organism when a procedure is conducted with electronic therapy has a homeopathically low magnitude. Thus the doses are varied only with respect to time, and the procedures last from 5 to 30 minutes. The polarity of the electrostatic charges on the ebonite is negative. Positively charged dielectrics (plexiglas) have been recognized as unfavorable for the organism.

The substance of the energy carriers may vary, and therefore the methods (generators) of affecting the organism are different. But the therapeutic and normalizing effect does not depend on the substance itself, but on the electric charge it carries--the energy of an electromagnetic field.

The method of electronic therapy substantiates the mechanism of its effect and technical application (1. Self-application. 2. Application by an assistant. 3. The taping of the disk to the surface of the skin over the diseased part of the organism in order to stimulate and normalize the electrical effect on its bioplasmatic state is new and original).

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What is new is to connect one's organism to the patient's organism by creating a closed bioelectric circuit and the possibility of strengthening the bioplasm and of aiming its energy into any region of the organism that interests us, including portions in a cast because of bone fractures.

The biological electrode may be any portion of the surface of living organisms (two or several) in contact, regardless of the size of the area of the contacts (head, trunk, extremities).

Mutual therapy is possible when a bioelectric circuit is created, since in electronic therapy the current flows through both organisms (those of the patient and the physician); that is why both of them are exposed to the therapeutic effect, even though the nature of their illnesses may be different.

The calm and sleepy state also occurs in both, but to different degree.

The therapeutic disk is a disk with rounded ends cut from sheet ebonite (10-12 mm thick, 110 mm in diameter), with a polished contact surface. An ebonite handle is glued on the center of the disk or screwed in (not all the way through). A plate with rounded ends without handle can also be made from the same sheet ebonite (300 x 120 mm) for attachment to the skin.

Ebony possesses the same normalizing properties as ebonite. Research conducted over the last 6 years in the application of electronic therapy has revealed the most valuable and extensive capabilities of stimulating and normalizing biotic processes and of affecting the brain, and it has made it possible to understand the nature of certain intimate bioplasmatic phenomena taking place in the organism. For example: 1. The influence of electronic therapy in heightening the activity of the purifying mechanisms of the respiratory tracts (the ciliate epithelium and mucus cells). 2. Massage is above all another bioelectric procedure involving interaction between the masseur and the patient. 3. Inflammatory processes are accompanied by electrical phenomena (furuncules and so on), pain is easily assuaged, the process is diminished, and tissue physiology becomes normal. 4. Electronic therapy promotes normalization of tissue nutrition in connection with bone breaks, which is especially important when a cast is applied (prevention of edema, acceleration of metabolism, consolidation of the fracture, and removal of pain). 5. Elimination of the phantom pains of amputees.

The principle of the general and total stimulative effect of electronic therapy on the organism's nutrition explains the "universality" of the method, which has been clinically confirmed in the treatment of various diseases of the organism: for example, radiculitis, [illegible], polyarthritis, pneumonia, hypertension, gastritis, influenza, phlebitis, complications in the postoperative period, bone fractures, and so on. Electronic therapy is counterindicated for cardiovascular diseases, in the postinfarctus state, and when there are cerebral hemorrhages.

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If in the terms of medical biophysics we define a disease as a disruption of the organism's energy balance, then this balance can be reestablished by the method of electronic therapy without using chemical agents. Electronic therapy has been administered to patients (about 3,000 cases) in connection with surgical, therapeutic, infectious, and nervous ailments, and positive results have been obtained in most cases.

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OBSERVATIONS OF MYSELF AND OTHERS

[Paper by Georgiy Kenchadze, Tbilisi, USSR, in Russian]

[Text] From childhood on I have had an inherent tendency to treat myself because I had a great dislike of medicine. From a very early age I therefore became convinced of the power of physical education and sports. And later this led me to other forms of exerting an influence on myself. I am referring here primarily to autosuggestion or to what is now called autogenic conditioning.

When a man is master of himself, he is not a burden to others either. On the contrary, I have noted that people like to come to me for help, for help of various kinds, including medical aid.

I obtained from my father notes on Tibetan medicine, and I obtained from them several methods of treatment, above all methods of applying heat at certain points. I have found the same thing in Badmayev and then also in the yogis.

Whereas others give themselves over to meditation, and thus fall into mysticism, I have been active: I was interested in practice, and I made use of the practical advice. However, I had almost gotten beyond hatha-yoga.

Animals have been a subject of my constant interest. For a long time I observed the behavior of animals, chickens, dogs, and snakes and predators in the zoo.

After many years of work I came to the conclusion that influence by means of biological rhythms had the greatest importance. The rhythm of certain frequencies of oscillations of a living organism causes a corresponding reaction in another organism. That is what makes it possible to affect patients of any nationality, even if one does not know the language; that is what makes it possible to affect patients of any age, including infants, patients in a serious mental state, or animal patients.

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When I was studying the religions of various nations I also became interested in rituals and the ways in which priests exerted an influence on parishioners. I tried to study rituals and rites in all their details. There are a number of things which are rather difficult to explain, but I can say that we are dealing here not only with a psychic effect, but also with something else, something that is possibly magnetic; I cannot ignore this, for I have used it in my treatment.

I must note in this connection that different diseases can be successfully treated at different times of the year, and that is why I prescribe for chronic patients a visit at a particular time of the year or in a particular date of the month, especially when it is a case of epilepsy, /lunatism/, or somnambulism. (For instance, I prefer to work with epileptics in the springtime.)

One of the most interesting cases in my practice was the treatment of a child named K. It was this case that helped me to become firm in my opinion concerning the effect of biological rhythms deliberately organized by the healer.

Notes on the treatment of the child K. All physicians had refused, including the best known physicians. For more than a year the child had laid without moving, was out of contact, did not recognize his parents, did not distinguish objects, and was completely indifferent and silent. He was literally like a jellied fish. Various diagnoses were framed in the child's case, but cerebral paralysis was the one that predominated.

It was impossible to affect such a child either psychologically or by suggestion. He was not receptive to any sort of verbal effect. I decided to use passes of the hand, and this immediately had a certain effect. After just a few days of this the child began to make his first sound and soon sat up. And then he spontaneously got to his feet.

Four years have now passed since the commencement of treatment, the child walks and runs by himself, drinks, displays a fine musical ear, eats by himself. He is quick to catch the meaning of those close to him, he is accessible to contact, and he encourages hope that he will talk. Physicians who treated him previously and gave him up see this only as a miracle.

The case with the child K. is not an isolated one. Work with similar patients has yielded approximately the same results.

The more I studied the system of the yogi and their methods of treatment, the more I was drawn to Tibetan and Chinese folk medicine. Only afterwards did I become familiar with the method of Georgian folk medicine--the "karabadan."

I have always been interested in all types of hypnosis, but I want to note that I disagree fundamentally with the ordinary methods of hypnosis in

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which the room is darkened, noise is eliminated, or a hypnoscope is used. I believe that words are not necessary in hypnosis, since in all these cases the necessary standard of effect is created, and the patient becomes a manipulated object to some extent. In other words, I am an adherent of "nonverbal" procedures under the most ordinary conditions.

When a healer has a certain experience in "inducing" the states he needs, when he is able to achieve stable states and representations, then at one point he notices that this no longer requires a great deal of inner work, that a mere "hint" or "recollection" is altogether sufficient; in other words, a provisional sign or symbol of the information is sufficient to create the necessary rhythms for their transmission to the patient.

I might call my method of treatment biostimulation, if you like, since I have come to the conclusion that the problem of treatment is to stabilize in the patient rhythms of certain frequencies, personal biological rhythms beneficial to his organism. Perhaps we might refer to this as biostimulation, though this term does not entirely cover it.

My practice is now 10 years old, and I have had thousands of patients, primarily patients with nervous and mental illnesses, with headaches, and with bronchial asthma. I have worked a great deal with singers and musicians. Ladies who the doctors have told that they would not sing for 1 or 2 years have sung beautifully in just a week. I have relieved people of occupational fears, and with my help performers learn to concentrate better and to organize themselves.

But once I had to organize myself to the fullest. I conducted an experiment with an untamed tiger in the zoo. This was, of course, more an experiment with myself than with the tiger. I wanted to see if I could remain with the tiger, whether he would obey me, and whether he would go in the direction I told him to. In most cases the tiger obeyed. What was this--hypnosis or telepathy? I cannot call it telepathy to transmit information over a distance if by telepathy we mean information transmitted in some particular language, even though words are not spoken For me this is only a language of representation.

How does a boa constrictor affect a rabbit? Obviously he first engenders a representation of torpor within himself, and then this torpor is transmitted to his "percipient," which is a stereotype that is imposed. But in the boa constrictor this is so to speak "conscious" activity, while in the rabbit it is unconscious.

I believe that in the near future bionics will become concerned with man as well, and then our term "psychotronics" will be fully justified.

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EXPERIMENTATION WITH ORGONE ENERGY BLANKETS

[Paper by W. Edward Mann, Ph.D., professor in sociology, Atkinson College, York University, Toronto, Ontario, Canada]

[Text] Reich's orgone theory. Parallels to it in other cultures, e.g., prana in India, mana in Hawaii. Development of the orgone energy accumulator. The construction of the accumulator, and the orgone blanket. Reich's findings on their energy facilitation. His theory as to how they operate.

Experiments with my small three-layer orgone blankets over a period of 18 years:

a) with psychics: how they reacted, how they explained the energy flow.

b) with "armored" subjects: they tend to feel very little at first; explanation. Other "negative" findings. Role of the weather on energy flow.

c) with persons having minor physical ailments such as colds, backaches, fever and rheumatic pains.

Some caveats in the use of the blanket.

The orgone blanket as a family health aid; what is its future. Types of research now underway to maximize its power; other kinds of research needed to validate and extend its usefulness.

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INFRARED EMISSION PATTERNS OF HEADACHES

[Paper by Paul Ruegsegger, M.D., director of biotronics division of 25th Century Foundation, 115 East 61st, New York, New York, in English]

[Text] Headaches, an experience common to us all, have been haunting humanity since man first began to use his mind and he became aware that headaches interfere with the powers of abstraction.

Like other phenomena under study at this congress, headaches have followed man through the ages, have obsessed and mystified him as a ghostlike presence and have been defying all attempts at laboratory testing and clinical study until recently.

The crushing head pain may be quite real to the patient, but definitely "nonphysical" to his doctors, "symbolic" to his psychiatrist, and it might be perceived as "spirit possessed" by the shaman consulted by the Eskimo client.

Chronic headaches unlike any other pain, have a conditioning effect on the patient's mind, and thus on his behavior, by leading to a life of pain avoidance in a world perceived as essentially hostile.

These mind-altering yet elusive properties of the invisible phenomenon of headaches challenge the powers of observation and deduction of "inside pain" perceiver and outside observer alike.

To develop strategies for the study of analogous invisible phenomena, the perception of visible and invisible realities will be described from the viewpoint of (1) the outside observer, and (2) the subjective inside perceiver:

(1) The Objective Outside Observer:

We cannot perceive headaches with our eyes nor ears, but we may detect tender spots with our fingertips and sense inflamed areas with the back of our hand within the pain pattern.

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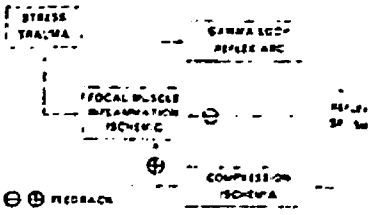
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And we come to realize that the world of vibrant energy we exist in is mostly invisible except for the minute segment of the electromagnetic spectrum from 0.4 to 0.7 micron our eyes are sensitive to: the visible world. If instead they would be sensitive in the range from 1 to 9 microns we would see a world of infrared luminosities as a function of temperature. We would see as the thermograph sees when looking at people with various headaches.

The thermograph* is an infrared camera which takes heat pictures composed of 80,000 T° measurements per second with a resolution of 0.2° C. The thermograph acts as an infrared eye by converting heat emissions of invisible lower to visible higher frequencies.

The Figures 1, 2, and 3 show thermograms of vascular, muscular and neuralgic headaches before and after elimination treatment (for details see legends). [Figures not reproduced] The headache patterns appear as infrared luminosities emanating from inflamed areas, brightness increasing with temperature. Figure 4 explains the feedback mechanism responsible for the chronic recurrence of headaches.

Figure 4. Feedback Derangement in Self-Perpetuating Inflammation



Cybernetic description of reflective headaches. Chronic recurrence is explained by self-exciting and self-perpetuating feedback derangement in focal muscle inflammation. Source: Ruegsegger, P., "Reflective Headaches," HEADACHE, No 9, 1970, p 201; "Man and His Headaches," HEADACHE, No 10, 1970, p 126.

(2) The Subjective "Inside" Perceiver of Headaches:

First, this disorder more and more has been driven underground by the ruling concept that these headaches are due to personality problems, or hidden hostilities, or both. After ineffective therapy, these patients learn to bear the stigma of this "self-inflicted" disorder in silence. These questions are no more academic if we remind ourselves of the huge social cost on a global scale, if an estimated 300 million people all over this planet are allowed to suffer not from intractable but unresolved headaches, given an incidence of 8 percent.

* Barnes/Bofors Model M101-Medical Thermography (Mrs F. D. Ruegsegger).

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Second, the infrared signatures of these headaches can now be made visible and measurable. But the essential problems do not lie so much in what they are as in what they do. Chronic intractable headaches have a conditioning effect on the mind which is potentially profound and long-lasting. They are, in a sense, "headsprains," but unlike any other sprain they affect the whole person, the reach of the mind, the awareness of one's self and of others. Headaches in response to recurrent trigger events will condition the patient's behavior. Pain stimuli, by modulating the sensory input and reaching the centers of perception, may distort the subjectively perceived realities and affect the psychodynamic cognitive, aesthetic and possibly transcendental experience.

Third, elimination treatment that produced cessation of lifelong pain has its surprises. The patient initially undergoes a period of rapid deconditioning of the pain-induced reflex responses he has built up over the years, and this may be followed by erratic oscillations in moods and actions As the accumulated responses of decades dissolve, the patient experiences extreme changes, day by day, in self-awareness and self-esteem. And the physician must be prepared to help the patient cope with these chain-reacting, many-dimensional changes that take place in both the patient's internal and external world as he begins to adjust to the realization that his life is no longer one long headache.

PHOTO CAPTIONS

1. p 165. Vascular migraine of 20 years duration, during acute attack (on left), regression on day 4 of elimination Rx (on right). Source: Ruegsegger, P., "Thermographic Headache Signatures," Proceedings of the International Headache Symposium, Elsinore, Denmark, 16-18 May 1971.

2. p 165. Muscular tension headaches, daily for 30 years, before (left); cessation of pain after 7 days, residual pattern after 49 days of periodic Rx (right).

3. p 166. Neuralgic headaches for 36 years. Before (top series), 44 days after treatment (bottom series) with normalization (hot nose surrounded by rectangular brightness increase are due to incidental head cold with nasal blockage).

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A GENETIC HYPOTHESIS FOR PARAPSYCHOLOGY: POSTULATING PSI-GENES

[Paper by Jeno Miklos, licentiate in chemistry, Medical Research Center, Academy of Medical Sciences, 16 Boulev. Dr V. Babes, Timisoara, Romania, in English]

[Text] By a mere bird's-eye look at the philosophy of science, there can easily be realized that most (if not all) scientific theories and hypotheses rely not only on experimental and observational findings, but on companion axioms and postulates, as well. Parapsychology may not be an exception from this rule (cf. my arguing for this point also in a paper of mine in this volume: "A Plea for Multidisciplinary Approach and Interdisciplinary Cooperation").

Along the line of the biological-physiological correlates of psi, genetics has been thus far perhaps the most often invoked parameter. There have been several claims of hereditary factors throughout observing and experimenting ESP (Extrasensory Perception) and PK (Psychokinesis) (for a recent popular account, see (1)). Let me pursue a little further on this line.

From a hereditary point of view all biological functions (phenotypes) do ultimately own underlying genetic supports (genotypes). However, differences occur even among subjects having the same genotypes (e.g., monozygotic twins); this status leads to a concept of biochemical individuality (2). Behind biochemical individuality, accompanying/underlying it, there are other variations among living beings, bearing upon ontogenetic and phylogenetic differentiation (3). Putting psi-phenomena into this context, psi-abilities--regardless of their overall nature: whether emergent (4) or something else--ought also to obey genetic rules. Chauvin (5) is supposing that one might look for specific brain areas responsible for psi-abilities; one may apply the term psi-neurons, populating this area. Such kind of highly differentiated (likewise the normal neurons themselves) psi-neurons--if their existence were actually to be proved--would have arisen only by means of the established gene regulatory (6) actions.

Concepts like the ones above can be reached even by turning more explicitly on the molecular biology. In the autumn of 1970 I had the occasion to learn

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i.. Crick's book (7) of the following: "I have (...) been approached by a well-meaning and enthusiastic modern clergyman in Cambridge, who suggested that there must be some fascinating relationship between DNA (deoxyribonucleic acid) and ESP." (pages 85-86) (May I, however, mention that Crick is reluctant to the psi-hypothesis, expressed both in the booklet concerned herewith and in a letter (8).) This came to resonance (and reinforce, as well) my 1967-dated feeling that genetic correlates of psi may be traced down to molecular level via nucleic acids (inter alia, this idea of mine, occurred to my mind while reading a book on occultism, does readily fit in what Selye (9) is rather often claiming of scientific discovery: "(...) as a rule the greater a scientific creation, the more it is conceived by instinct and emotions. To make a great dream come true, the first requirement is a great capacity to dream; the second is persistence--a faith in the dream (...) the greatest creator(s) in any field of human endeavor are motivated mainly by imponderable instincts and emotions." Of course, the remark is unavoidable ethically that I am not at all assuming myself a great creator, since the thoughts put forward herein represent but hypothesis.). However, it was only in May 1971 that the idea took a somewhat intelligible form, after learning in Bullough's book (3).

Physiological functions are subject to trace them down to the chromosomal components (operons, cistrons and genes) via the one gene-one enzyme (E. L. Tatum) or one gene-one function (G. W. Beadle, cited in (10)) conception. Nervous activity, likewise several other functions, is a complex one. The same may well hold for psi; consequently, perhaps there is more adequate supposing rather a system of genetically linked genes than single genes to be involved in underlying this function. As it is known from genetics, hereditary traits or characters (= genes) may be either dominant or recessive ones (for details, cf., e.g. (11)). Psi-ability had very likely appeared at a certain (phylogenetic) evolutionary stage and had been preserved by means of ontogenetic (and subsequently phylogenetic) hereditary mechanisms; this is wherein postulating psi-genes may come to scene. Once acquired, the psi-genes are also to obey general genetic rules, such as repression, activation, incomplete dominance, crossing over, recombination and so on. In this context there would have not to be any longer wonder about why certain subjects are psychically gifted, while others being less sensitive and yet others apparently not at all manifesting psi-abilities. For, by gifted persons there may occur the phenomenon of the dominance of psi-genes or their continuous derepression-activation, states reached while ontogenetic (embryonic and tissue) differentiation. Conversely, subjects exhibiting only moderate psi-abilities do own only an incomplete, if any, dominance of psi-genes in their chromosomes. The apparent lacking for any psi-sensitivity might be accounted for by an irreversible repression of psi-genes while ontogenetic differentiation, or alternatively, by an actual failure of the descendants to inherit them from the ancestors (that is the loss of this specific genetic material). As regards the learning of paranormal abilities (touched on by Beloff (12)), processes of the kind as outlined above, may again be invoked: molecular psychobioloty has already learned of the neuronal genomes' readiness for reversible functioning

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(mainly manifested in experiments of molecular approaching learning, memory and behavior; cf., e.g. (13, 14)), despite their highest degree of differentiation. Concerning the regression, ended in disappearance, of psi-abilities--a rather regrettable phenomenon, especially when it is occurring by subjects unique in their gift, such as the case with Ted Serios (15)--one may make use once again of molecular genetic mechanisms: beyond the well-known fact that neurons are continuously dying away throughout one's life span, molecular processes (e.g., irreversible or lethal-to-cells mutations) or aging may affect psi-genes, too.

There are numerous references in parapsychological literature to that: "For whatever mysterious reason, good subjects have become rarer and rarer and not even a resort to the mass media has been able to reverse this trend" (12). One possible explanation attempting to dispatch at least a part of the aforequoted mystery, comes in terms of the genetic concepts: those of selection, of struggle for the existence among genes themselves. If psi-genes were to precede the genes responsible for normal (sensory-motor and language) information processing, then, at a certain stage of evolution had become less significant for the species' survival and had been overcome (lost, or hidden for functioning by the process of irreversible repression) by their competitive counterparts. Perhaps, this arguing is settled more clearly by another citation from Beloff's paper (12): "(...) the states of mind, or the condition of the brain, conducive to the manifestation of ESP must be not merely different from but in some sense incompatible with those that are conducive to the functioning of all our normal abilities." Standing on a position contrary to pessimism, may I oblect that the status that "good subjects have become rarer and rarer" does not necessarily imply that psi-genes have been definitely left out among the genomes' overall gene population; I think rather they are merely resting therein, eclipsed by the actual genes' activity.

Of course, most of the audience will wonder whether such a hypothetical incursion to molecular biology could as well be followed by experimentation. To cool both the skeptical and impatient minds, one must remind one of the fact that even in cancer research--where efforts (intellectual and financial) are long since being spent with incomparable enthusiasm--outstanding results, relevant ones within molecular biological coordinates, have come only in recent years, and not at all as suddenly as ones had expected early this century after the first biochemical explorations. Nevertheless, some genuine and promising experiments do offer hope. Both fortunately and unfortunately enough, brain (and, together with it, human mind, too) still does own an overwhelming unexplored--beyond that the most percent of it is supposed as unused one--area, which may well offer a potential field of investigation for--among others--psi. One of Chavin's cauterization alternatives (5) was to furnish us at least a closer neuroanatomical insight to psi; further improvement of the proximity to the very essence is self-understandable. In genetic context selection experiments on animals (e.g., mice) would there be achievable (16). Another alternative is theoretically envisaged by selective neurotropic mutations (a fair molecular genetic

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replica of Chauvin's cauterization) in order to permit following improvement versus disappearance of psi-abilities. Beyond the macroscopic potentialities for the location of psi-qualities (brain's apparently functionally unused areas, as mentioned above), the molecular level provides still another reservoir. In the 1960's there has been believed that the genomes of a wide range of living beings bear a puzzling degree of informational redundancy, containing as many as thousands and millions of copies of repetitive nucleotide sequences (for reviews see (17-20)) of which implications still are open to speculation (Perhaps, there is worth pointing out that interestingly enough, mouse--just the animal preferred by Chauvin (5) for psi-experimentation--has the highest degree of such repeatedness!).

I should like to close this paper making mention of my own modest experimental evidence along the lines traced above. It concerns the "Wedding Ring Test," a sex-linked dowsing-like probe (for details the interested reader is referred to the lecture to be given at the dowsing section of this conference): there has been observed that children aged 5-6 years were not sensitive to testing, likewise adults with no prospect for having children any longer. This aspect of the kind of psi implied in the tests claims immediately for biological and physiological correlates; there appears, thus, that hormone-functional state comes to the forefront thereof. For, in the case of prepuberty children tested thus far, the lack for susceptibility may beaaccounted for by their early stage of sexual differentiation. Yet, sexual differentiation is accomplished via hormonal gene-activation. Hereby we may well be faced to the very moment of the appearance (or, nonappearance) of a psi-ability.

I trust that the suggestions aligned above will surpass their Gedanks experiment- and hypothetical-stage, and likewise as is happening with psychology and psychiatry (cf., e.g. (21)), will give rise to a psi-genetics, which in due time is to become Rhinean (22) psi-biology's forefront piece. In addition, if I am permitted to extend the spring of hypothizing to its maximum, one day there might speak of the molecular biology of psi, by analogy with Molecular Neurobiology, term accepted for use by the interdisciplinary Neurosciences Research Program (Brookline, Massachusetts) (23, 24).

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INTERPERSONAL RELATIONS AND ENERGY TRANSFER

[Paper by Jiri Brzdna, MD, Neurology Department, Okres Institute of Public Health, Kutna Hora, Czechoslovakia, in Czech]

[Text] The problem of mutual relations among human beings, animals and plants is shifting to the center of attention because our planet is becoming overpopulated. Basic experiments in the field of proxemics, to study the relationships among rats when their number becomes excessive in a given area, showed changes in the behavior of individuals and in normal coexistence. In the same way, when the number of Sika reindeer became excessive within a limited territory, there appeared stress conditions from which the animals actually perished. Also in human society one can determine a number of factors which indicate a critical condition of the population when the land becomes overpopulated. In contrast with the accumulation of individuals within a limited area, there are conditions of depravation when individuals are isolated from society, from intimate as well as collective contact. This applies to prisoners, to people living in isolated groups, on submarines, ships, in cosmic space, or in experimentally isolated chambers and caves.

The basic question in both cases is which information channels are disrupted in interpersonal communication, by either an excess or a lack of information. Furthermore, which of the biological functions are disturbed or forcibly changed. Even though relations between people, and among people, animals and plants are studied by biologists, physiologists, psychiatrists, psychologists, sociologists and politicians, a broader role in the formation of interpersonal relations is played by the family, school, work environment, and also by the communications media: motion picture, television, theater, press, literature, and music. In the formation of individuality by means of information, important is the transfer that takes place, in terms of energy, by means of acoustical, light or infrared waves, vibrations, or perhaps infrasonic waves. From the viewpoint of interpersonal relations, likewise important are the individuals' subconscious reactions to stimuli that have not been defined in greater detail so far, and the source of which is man himself, or animals and plants. These stimuli can change the

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psychic disposition or even penetrate consciousness. Among the energy transfers of different range, we were interested in energy transfer demonstrable in neuromuscular activity. This transfer may cause not only changes in the tonicization of the recipient's muscles during the agent's activity; through afferent conduction it can also change the mental set, the cerebral analysors, and it may be the source of information. From our previous investigations of primary energy myotransfer -- in 1942-1968, by the method of myotensicmetry, electromyography, and by monitoring the electromagnetic energy during muscle activity -- we cite the following:

Energy transfer takes place by means of electromagnetic waves, particularly in the vhf band, and can be demonstrated by instrumental monitoring as well as by biological change in the recipient's muscle tension during the agent's muscle activity. It is easily demonstrated by the reaction of the dowsing rod and of the biopendulum (sideric pendulum). We demonstrated myotransfer experimentally between frog neuromuscular preparations, and also from animals to man. In the present work we have set out to investigate interpersonal relations in space, from the viewpoint of myotransfer during tonic, phasic, and involuntary motor activity, and during psychomotor and emotional changes. In conclusion we have investigated the relationship between animals and plants, using the methods mentioned above.

Material and Results

Experiments with live insects and maggots, and with frogs, fishes and rabbits, demonstrated the existence of distant energy transfer to human muscles. Muscle tension, bio-oscillations, deflection of the dowsing rod, and electromyographic activity changed as a function of animal activity. Transfer from the smooth muscles of housefly (Musca domestica) maggots rose considerably during toxic irritation as the movement of the maggots became more lively. Transfer ceased upon refrigeration, and it reappeared after defrosting and a renewal of movement. In the case of a frog, transfer rose as the frog's motor activity increased, and it continued even after decapitation. Transfer appeared on a frog neuromuscular preparation during electric stimulation of a nerve or muscle, and it was commensurate with the extent of tetanic contraction. When an aluminum filter was inserted, transfer ceased (Table 1). The beating heart of a frog was likewise a source of energy transfer. When the heart was arrested, myotransfer ceased (Table 2).

Table 1. Transfer From Frog Neuromuscular Preparation to Man (bio-oscillations)

pps	0	0.3	3.0	10	30	30, Al filter
	5x12	35x65	55x65	73x75	90x110	1x60

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Table 2. Transfer From Frog Heart (bio-oscillations)

Frog with heart	Without heart	Heart resting	Contraction	Arrest	Beating after electric stimulation
36x65	11x55	16x38	30x52	7x46	35x65

Transfer was especially high from convulsive animals. Sometimes the convulsions of a rabbit were the source of so strong transfer that the recipient's highly activated forearm muscles even broke the dowsing rod. On the graphs of energy transfer it was possible to distinguish phases of tonic and clonic convulsion. Transfer from a carp ceases as the convulsions and fasciculations disappear. A low activity of transfer from a sacrificed rabbit continues so long as there is a heartbeat. From bulls killed at slaughterhouses, we detected increased transfer during the terminal convulsions, and over the carcass during fasciculations. Transfer ceases after curarization of the muscle and during electric stimulation. It increases after an injection of adenosine triphosphate. Transfer from insects is commensurate with their activity that depends to a considerable extent on the temperature. An anthill, for example, shows high activity in summer, and low activity in cold weather. Transfer from cats increases during excitation, but declines during narcosis and sleep. In the case of pigeons, the degree of transfer is commensurate with muscle tension and is high when the pigeon is cooing. This applies also to crowing roosters, and to cackling hens. Transfer from dogs increases when the dog is active, and is particularly high during extrapyramidal involuntary activity. We demonstrated also the existence of reverse transfer, from man to animals. Twitching occurred even on a frog neuromuscular preparation during subthreshold stimulation, after transfacilitation by myotransfer from human muscles. Myotransfer significantly influenced the tonus of the pectoral muscles in pigeons, even when the muscles were covered with black paper. Transfer ceased when an aluminum filter was inserted. Transfer was successful from striated or skeletal, cardiac, and smooth muscles.

Transfer From Plants to Man

We were able to ascertain biologically the transfer of energy from plants, by its effect on muscles that resulted in a change in muscle tension, by the oscillations of a biopendulum, and by the deflections of a dowsing rod. Transfer depended on the biological activity of the plant parts. It rose during photsynthesis, in the vegitation period and during germination. It was low during dormancy and in the seeds. The changes in energy transfer corresponded to the changes in electric conductivity, for example, in the case of a philodendron. We found a significant difference in activity between the three-leaf and the four-leaf clover, and this difference can easily be detected by a sensitive person (Tables 4, 5).

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Table 4. Biotransfer From Clover Leaves (bio-oscillations)

Control	3-leaf clover	4-leaf clover	5-leaf clover	6-leaf clover	2x3-leaf clovers	10x3-leaf clovers
1	15	33	29	44	15	22

Table 5. Distant Biotransfer From Clover Leaves

Distance	20 cm	0.5 m	1.0 m	1.5 m	2.0 m	0.5 m
		(bio-oscillations)				(dowsing rod)
Clover						
3-leaf	15	10	8	6	5	20°
4-leaf	33	30	28	20	15	60°
6-leaf	44	35	28	27	17	85°

Reverse transfer, from man to plants, could be demonstrated as a change in the basic energy transfer from plants, by an increase of transfer after a nociceptive stimulus and when the agent approached, and by a decrease when the gardener approached. Electric conductivity also changed at the same time.

Transfer Between Animals and Plants

An example is the significantly high transfer when a philodendron is approached by a cat that previously chewed a leaf of the plant (Fig. 1). Shielding with an aluminum filter prevented this reaction (Fig. 1b).

Flowers reacted to pigeons in accordance with the pigeons' muscle activity. Animals reacted to a nearing plant by a change in their muscle tension and myotransfer (Fig. 2c, d).

Myotransfer Between Animals

Myotransfer-induced interaction between animals can again be demonstrated by a change in muscle tension and in transfer. This interaction may serve as a model of interpersonal relations. Besides myotransfer, there are also other types of transfer, in the same way as in the case of human beings.

Interpersonal Relations and Energy Transfer

Myotransfer that accompanies energy processes during muscle contraction is a direct function of the degree of tonic or phasic muscle activity. At rest in a supine position, total transfer is low and consists of myotransfer from the cardiac and respiratory muscles. When a person is

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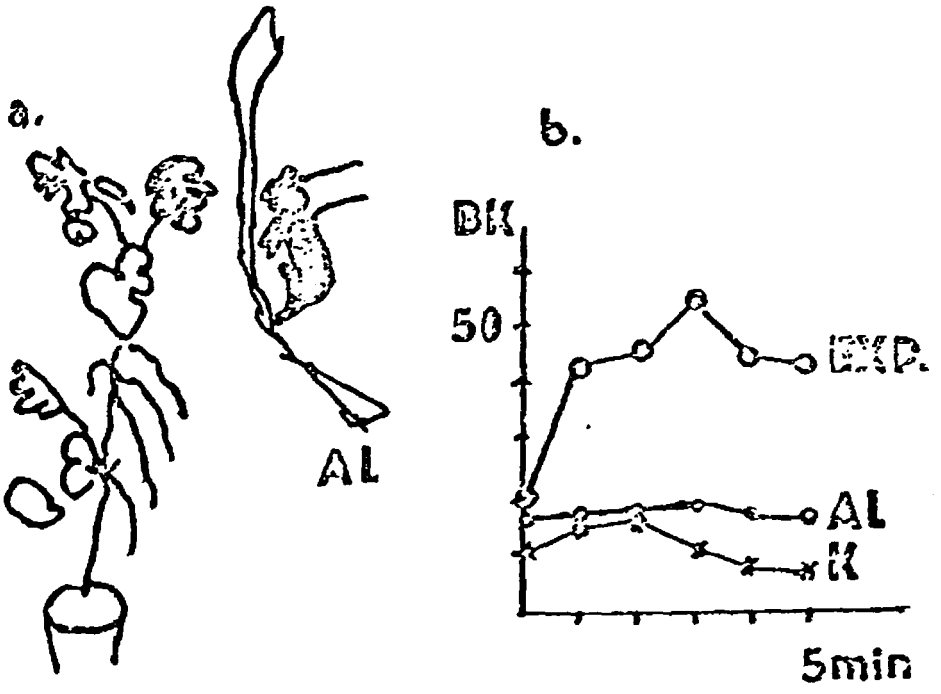


Figure 1. Philodendron's reaction to the cat.

K - Exposure before cat chewed the leaves;
Exp - After chewing;
Al - After chewing and insertation of an Al filter;
BK - Bio-oscillations.

alseep, this transfer declines further. Deep inspiration, according to Valsalva, is a source of high transfer that can be used also in therapy. Expiration, on the other hand, causes relaxation of the recipient's muscles. In arrhythmia patients we observed an influencing of heart action and an improvement of the rhythm as the patients approached a person whose hearth was normal. Myotransfer and total transfer cease after death. During Jacksonian epileptic seizures, myotransfer increased and attained a considerable range. Myotransfer increases also in a standing position, and its nature is determined by the dominant muscle group when standing. Yawning is accompanied by an activation of the recipient's maxillary and inspirational muscles, and this explains why yawning is catching. Laughing involves not only the facial and abdominal muscles and the diaphragm, but also the muscles of the back, and there is feedback between laughing persons. We have demonstrated the rhythmic pulsation of transfer, commensurately with the laughter of spectators. Man's

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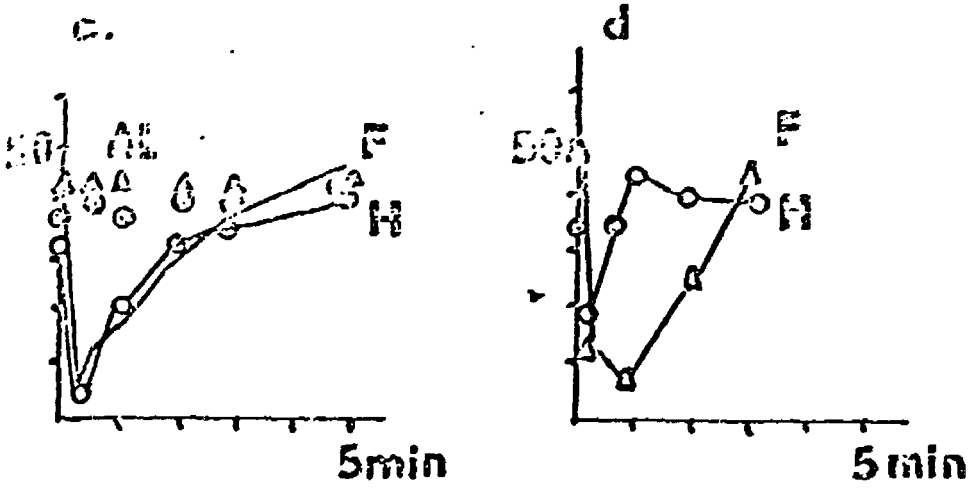


Figure 2c. Nearing of philodendron (F) and pigeon (H), and insertion of an aluminum filter (Al).

Figure 2d. Gardener approaching philodendron, and philodendron's effect on pigeon after exposure during the maximum decline of transfer.

daily activities that can influence other individuals include also smoking, in which there is an alternating activation of the inspirational and expirational muscles (Valsalva, Miller), and there is also transfer from the muscles of the extremities and the mouth (Table 5).

Table 5. Myotransfer During Smoking

Phase	Bio-oscillations	Dowsing rod
Person at rest, sitting	3x12	15°
Taking cigarette from pack	8x16	35°
Rolling a cigarette	20x32	85°
Cigarette brough to lips	10x26	65°
Lighting cigarette	11x26	80°
Inspiration	27x40	120°
Puff	30x30	120°
Expiration	11x22	-30°
Stubbing cigarette	11x30	25°

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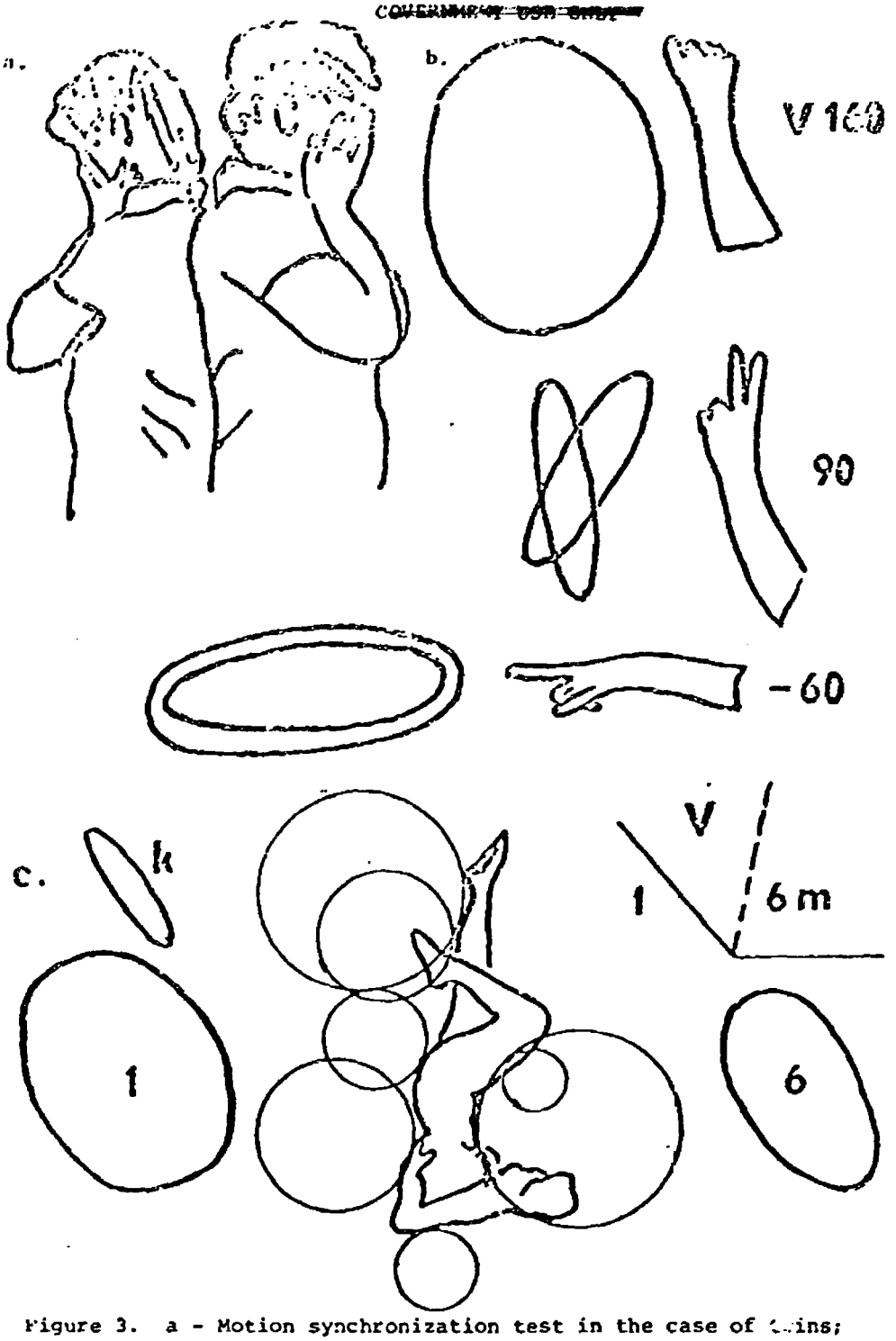


Figure 3. a - Motion synchronization test in the case of twins;
b - Typical myotransfer during gestures;
c - Tonus and myotransfer in Yoga, sarvangasana.

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An analysis of customary postures demonstrates the relationship between the type of transfer and the activation of the flexor or extensor muscles, and it explains as transfer also the frequent and already observed mutual imitation of postures and gestures. Such imitation is especially pronounced in twins, as we have demonstrated in motion tests (Fig. 3a) and by electromyography. Transfer occurs also during gymnastics, group exercises, and especially in Yoga (Fig. 3c).

Myotransfer extends broadly also into the area of sex, as we have noted elsewhere. It occurs in the smooth and striated muscles. Ideomotor transfer and the perception of concomitant vegetative phenomena likewise occur here, and they are amplified by feedback between the partners. Sexual transfer can be arrested with an aluminum-foil or other filter.

From the viewpoint of the disruption of normal interpersonal relations, important are the changes in transfer in the intimate and personal sphere. Such changes can be observed in states of increased neuromuscular tension and emotional disturbances, anxiety states. As an example we will cite a 25-year-old patient with normal tonus and low transfer. Upon excitation, her muscle tension increases considerably, and her transfer rises to high values over a distance of several meters; the excitation of another person by transfer can be demonstrated over a distance of 7 meters, and even through a wall (Fig. 4). The tonus and transfer become normal only after the administration of psychorelaxants.

We encountered similar states in patients suffering from spasmophilia and psychoneuroses (Table 6).

Table 6. Total Transfer and Psychic Irritation

Resting	Excited state (bio-oscillations)	Relaxation	Distance (meters)
32	44	10	0.5
16	38	8	4.0

A distinct type of transfer is found in aggressive posutre in which the defense posture's elements, mostly of a flexural type, are the dominant. An example of a defense reaction to an experimental attack from behind was a 32-year-old patient who reacted subconsciously to the attack by flexing her trunk and neck and raising her arms, and with a transfer of the flexor type. Once previously she actually had been attacked from behind. In another person, an ideomotor attack evoked a defense reaction.

However, energy myotransfer does not fully exhaust man's distant energy effect on his environment. Through a more detailed analysis and by biologically recording the transfer while shielding the individual parts of the body, we were able to evaluate also the proportion of the other sources of energy.

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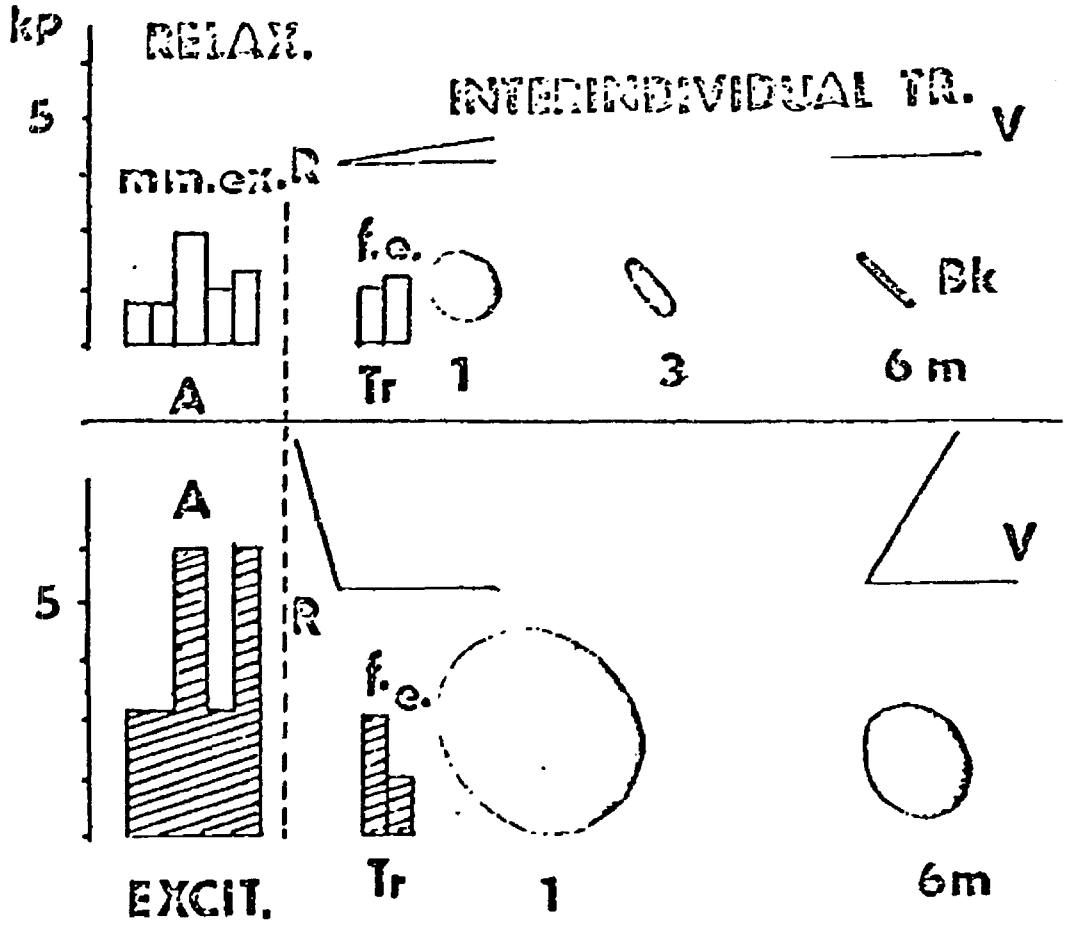


Figure 4. Interindividual transfer.

Relax - Relaxed patient at rest;
Excit - Patient in state of psychic excitation;
mm.ex. - Biceps brachii, forearm flexors, tibialis anterior, gastrocnemius, soleus;
A - Agent (patient);
R - Recipient;
V - Angle of dowsing rod's deflection;
f - Forearm flexors of recipient;
e - Forearm extensors of recipient;
Tr - Distance over which transfer was measured;
Bk - Bio-oscillations;
Kp - Muscle tension, in kilograms force

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Table 7. Total and Partial Energy Transfer

Total		Head		Goiter		Heart		Breast		Gonads		Muscles		
1	4	1	4	1	4	1	4	1	4	1	4	1	4	meters
43	30	23	6	23	6	35	11	30	17	23	4	25	6	Pendulum
120	30	60	10	30	5	60	10	30	5	45	10	45	10	Rod (°)

We found that highly active glandular organs such as the thyroid or the ovaries are sources of transfer. Even the brain showed transfer that interfered with myotransfer and was demonstrable especially in pathological states.

Myotransfer From the Thyroid

The range of myotransfer from a normal thyroid is about 30 to 50 cm. In cases of hypothyroidism, when the thyroid is overactive, this range extends to as much as 2 or 3 meters. After suitable treatment (with iodine), the range again drops to normal. In hypothyroidism patients, the range is considerably reduced. In children, also hyperthymism can be distinguished by means of biotransfer.

Gonad Biotransfer

Biotransfer is induced directly by the activity of the gonads. The testicles and ovaries alter their type of transfer from inactive to active during puberty, and back to inactive during menopause, respectively in old age, when the transfer activity that affects the striated and smooth muscles of the recipient ceases (Table 8). Gonad transfer plays an important role in sex and, together with sexual myotransfer, is the basis of heterosexual relations (Tables 9, 10).

Table 8. Gonad Biotransfer (Type 0 = inactive; Type A = active)

Age	0-5	5-10	10-15	15-20	20-30	30-40	40-50	50-60	60-70	70-	
M	1	4	5	5	0	1	9	2	11		Type 0
	-	1	4	8	20	15	36	18	-	-	Type A
F	2	5	13	2	0	0	3	21	20	10	Type 0
	0	0	1	19	38	81	60	32	5	1	Type A

Table 9. Gonad Transfer to a Carrier Pigeon (testicles exposed 30 sec)

Resting	0	1	2	3	minutes after exposure
36	65	60	30	30	Bio-oscillations
80	130	130	100	80	Dowsing rod (°)
110		160		100	Tonus

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Table 10. Total Sexual Transfer

Distance, meters	0.5	1.0	2.0	3.0	4.0
Resting	25	14	13	12	12
Gonad transfer	33	26	24	20	15
Sexual irritation	50	46	44	43	40

Cerebral Transfer

Our earlier observations revealed that changes occur in cerebral transfer during epileptic seizures and under the influence of vhf waves. We observed a change in transfer from decapitated frog heads, after shielding the eyes. Transfer declined also in people during sleep. In circulatory disorders there was a noticeable relationship between the irregularity of the hemispheric rhythms and the disease. We found that the rhythms of cerebral transfer were highly sensitive to certain vhf bands, and to facilitational and relaxaticnal myotransfer. We tentatively distinguished the following types of rhythm: (1) common and regular rhythm; (2) irregular rhythm in terms of amplitude, frequent in cases of migraine; (3) rhythm with pronounced spikes of high amplitude and low waves, in epileptics; (4) low rhythm in schizophrenics, in cases of inhibition, and during sleep; and (5) arcade rhythm that occurs in nirvana, after relaxation, and during exaltation caused by psychopharmacologic drugs. The arcade rhythm can be induced by rhythmically moving one's extended fingers about the subject's head. Here the fingers are a source of myotransfer that influences the energy processes of the brain cells, and transfer. On the other hand, constant tonic action of the hand has a facilitating to irritating effect. Hand gestures, therefore, have a deeper signaling significance in interpersonal communication. As basic types we may distinguish aggressive and warning gestures that are accompanied by high transfer, such as a clenched fist, extended finger or extended arm; and relaxational gestures such as blessing, waving or stroking. Relaxational rhythmic transfer affects not only the activity of the brain cells but also the skeletal and smooth muscles. We observed this in cases of biliary colic, where the spasm and pain disappeared after relaxational movements with the hand.

Table 11. Myotransfer in Various Muscle Activities

	Bio-oscillations	Dowsing rod (°)
Control	5x13	0
Flexion	53x53	130
Extension	70x25	-80
Fist	55x50	160
Keeping fingers crossed	55x28	130
Passes with the hand		
Relaxational	50x30, 20x11	10
Activating	85x25	-60
Laughing	40x30	85
Yawning	30x11	80

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Our presented findings on myotransfer and energy transfer demonstrate the significance of transfer in interpersonal relations, supplement I. V. Vasilev's similar experience with thought transfer and Rothlin's experimental work, and could contribute toward the definition of the aura or biological plasma. From the viewpoint of neurophysiology, the release of electromagnetic energy in the vhf band during muscle and mental activity has already been proven. Our experiments show that the connecting link between electromagnetic energy and the structural elements could be the resonance oscillations during the breakdown of the energy-rich substances such as ATP and ADP, which are the basic converters of energy in animals and plants. Energy transfer independent of man's first and second signal systems is a source of information also in the plant and animal kingdoms, and therefore we have called it the third signal system. For example, it is identical with Backster's primary perception. Our experiments over a period of many years indicate that a biological relationship exists among all living organisms, through molecular vibrations and electromagnetic waves. Therefore a more detailed study of the electromagnetic field's space-time relationships among people, animals and plants could solve the difficult problems in conjunction with the overpopulation of our planet.

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THE OBVIOUS AND NONOBVIOUS NATURE OF TELEPATHIC PHENOMENA IN SCIENTIFIC INVESTIGATION

[Paper by Petr Rezek, Prague, Czechoslovakia, in Czech]

[Text] Even if we merely skim through the literature on telepathic phenomena, we become convinced that most of the research is directed primarily toward answering questions, rather than toward raising them. Explanation of telepathic phenomena is the basic objective of research that dwells on understanding them in terms of the natural sciences.

The very concept of telepathy as the direct transfer of information between individuals does not tell us much about the nature of this transfer, but we will attempt to demonstrate that every transfer is problematic. The Latin word for transfer is translatio that has become widespread in technical terminology, and this is true also of other words beginning with the prefix tele-, for example, television, telephone, telescope, etc. Telepathy as transfer is conceived in a sense that is adequate for the world of technical inventions which have become so commonplace that they no longer amaze us. Telepathy is conceived as transfer realized by means of some known or unknown type of energy, or is made possible by some nonenergy factor that accompanies the functioning of the brain. Hence the interpretation of electroencephalograms, and wave measurements, to uncover the carrier of transfer.

Why is research of this type being conducted, why does the existence of telepathy still seem to us as nonobvious, and why are we striving to explain telepathy as some mystery, by means of the mentioned investigations? What type of answer can be expected of such research, and of what nature will the mystery be that we explain in this manner? Is it not obvious at first glance that this research is directed primarily toward the application of the investigated phenomena, and not toward understanding them? These are the questions that we raise in an effort to understand, but not to regulate or control. But the raising of such questions is nonobvious specifically because it strives to uncover the seeming obviousness of the horizon of understanding telepathic phenomena in a natural-science approach. To directly illustrate this seeming

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obviousness we will select an example that is the easier because it concerns a more obvious area, the interpretation of perception as causal transfer or information transfer. We will select visual perception that in its general outlines is regarded as clarified because we know the basic mechanism by which it takes place. Thereby we come directly to the problem of telepathy, because telepathic phenomena are regarded as extrasensory perception.

The mechanism of perception is understandable specifically because we are able to measure its physical carrier, in every phase of the process. The waves that travel from an object to the sense organ are the sought explanation, i.e., something known and obvious that is able to explain something that is less understandable and for which an explanation is being sought. The role of wave motion and energy transfer in the phenomenon of sense perception is basically understandable, and we are dwelling on it here only because also ESP research is striving to find such carriers that it regards a priori as a suitable explanation. The question as to how ESP is feasible has already been answered: as the transfer of some known or unknown type of energy.

ESP research and research of sense perception are similar in that both are investigating the composition and structure of the apparatus by which transfer takes place. Perception research investigates the eye, the optical pathways, and the corresponding regions of the brain. Perception itself is conceived as the function of a photographic camera that, through a set of lenses, projects onto a photographic place the objects of the outside world. In this approach, however, there is one simplification that has far-reaching consequences for an understanding of the actual phenomenon (of sense perception or of ESP). The fact has been overlooked that the camera itself presupposes vision in the person who is photographing. Without a seeing person, the image on the plate is not an image of the outside world. Only a seeing human being is able to determine that the image on the plate agrees with the world outside the plate. No being functioning on the camera principle is able to conclude that the image inside itself is a true reflection of something outside itself. An apparatus of this type does not even have any idea of the difference between inside and outside. It has merely data that are immanent, but it lacks any information which would enable it to judge anything that is outside. And if perception is interpreted as a causal effect, then such an apparatus cannot have a brain, just as a photographic plate cannot have one; it cannot have any idea of some object in the outside world, and it can be stimulated only locally. This approach is warranted in physiology. But it is unable to comprehend perception as such, must always presuppose it, and is thus forced to rely on a discipline capable of explaining perception.

Within perception in this sense, which is not limited merely to physiology but applies to the entire field of psychology, reality is divided

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into external and internal, but between the two realities it is impossible to find a connection that would be understandable. This approach to perception is the prototype of its natural-science interpretation which, by accepting perception as a priori obvious, disregards the fact that it is able to establish merely the simultaneous occurrence of a certain wave motion and of perception (this applies also to ESP) but in principle it will never be able to prove the closer connection that one follows from the other, because two separate planes are involved that are not mutually transferable.

Perception as such in the natural-science approach is actually incomprehensible to us, just as the advocates of this approach are unable to comprehend the telepathic phenomenon because proof of energy transfer is lacking. Comprehensible means capable of being understood, based on the phenomenon of perception as such. After all, we perceive the objects of our world before and about us, and not in our brain, from where they would first have to be projected in some way. Although we will not contend that perception according to the natural-science approach is entirely impossible, we must at least admit that perception as such is always presupposed in this approach. In other words, the original assumption underlying even the causal interpretation of perception is that objects as such confront us in the way they stand before us, otherwise even the experimenter would not have access to the instruments in his laboratory. Causal transfer, then, is not perception in the true sense, rather direct contact with the objects of our world that is linked to us by a direct, not an indirect causal chain. An indirect causal chain would make perception even less comprehensible.

It appears that if the natural-science approach, which is unable to explain perception as such, were applied to ESP, this would make ESP doubly incomprehensible. Even if a wave motion is found that is associated with simultaneously occurring ESP, this phenomenon as such will again be incomprehensible. On the other hand, if we succeed in making ordinary sense perception comprehensible, this might open the way to an understanding of ESP. It could be said that ESP will become a criterion for an understanding of perception in general.

Our answer, of course, cannot really satisfy anyone who seeks the mechanism by which this phenomenon is "carried." We perhaps could satisfy him by referring to a new type of energy. But we would merely be saying that this new type of energy occurs simultaneously with ESP, and we would not be answering the question as to whether this phenomenon as such is feasible. We would merely assume it as given, and hence as obviously occurring, i.e., we would be going beyond the question.

The term ESP suggests that such phenomena must be understood along the model of perception research. The problem of perception can be solved on the basis of the togetherness of man and his world, founded not on

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the transfer of energy or information, but on the original unfolding of the world's openness, where the objects present themselves to man. Where there is no need for transfer, because the objects confront us directly. "It is not true that some object, whether from the wakeful world or the world of dreams, is able to induce perception in some mysterious way only 'from the outside.' Rather, the ability to perceive what we encounter, and what confronts us, is based on man's extatic openness to the world. But it is likewise inconceivable why this openness should not enable man to encounter something that lies beyond the range of his sense organs. For it is never these organs alone -- i.e., the eyes, ears, tactile organs, nose, and tongue -- that are able to perceive something. It is never because he has the appropriate organs that man cannot see, feel, hear and taste. Rather, he can have these organs, and they are able to function, because man is, first and foremost, a being open to the world, a being that possesses an entirely original understanding of the world, and the ability to perceive." (M. Boss, "Der Traum und seine Auslegung" [Dream and Its Interpretation], Bern and Stuttgart, 1953, pp 207-208.)

On this occasion we are unable to present the Bossian theory in greater detail beacause, in an effort to remain brief, we would have to resort to simplification. And this would hamper rather than enhance our approach to an understanding that differs so from our world outlook and is guided by modern metaphysics that has been made concrete by mathematical natural science. Therefore we have limited ourselves to presenting the conditions which, if we decide to accept them, will become the first step toward a dialog with the Bossion concept of man and of the world. We can understand only if there is a dialog. In the present contribution we have been unable to carry on a dialog and have merely paved the way for it.

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SCIENTOLOGICAL TECHNIQUES: A MODERN PARADIGM FOR THE EXPLORATION OF CONSCIOUSNESS AND PSYCHIC INTEGRATION

[Paper by Ingo Swann, Church of Scientology, in English]

[Text] In 1953, a novel method of psychical rehabilitation through the use of recall and erasure of traumatic material was introduced by the publication of "Dianetics: Modern Science of Mental Health," by L. Ron Hubbard. It enjoyed voluminous sales and acclaim. Hubbard subsequently developed other mental inspection processes which, because these differed in context from Dianetic recall, he termed as scientology, or "the science of knowing how to know." Since the introduction of scientology, both the subject and the movement it has inspired among many people have been both topics of derision from detractors on the one hand, and the source of significant emergent ability improvement on the other hand among most who have availed themselves of scientological techniques.

It is not the purpose of this present paper to review the phenomenology dianetics and scientology have engendered in the sociological sense. Neither will an endeavor be made to view the subject from the viewpoint of critical appraisal. An assessment of scientological techniques indicates wide possibilities for pedagogical study. A review of the literature of the scientological premises and methods indicate involvement with the problematic man and his view of himself as a conscious psychic entity attempting to correlate himself with physical constructs of matter, energy, space and time.

It is thus seen that the fundamentals of scientological inquiry stand upon certain concepts of awareness and consciousness, as well as psychic apprisement of man within the physical universe. In this context the premises and techniques of scientology, as established by its founder, L. Ron Hubbard, are seen in many aspects to have both valuable correlates in several fields of scientific inquiry, and also contain possible practical application within the context of emergent alternative future histories.

It is apparent that the modes and methods of scientological inquiry have emerged during a time in which man's cherished view of himself as a

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mechanistic organism has come under observation and challenge. As early as the last century, as indicated by Margenau (1), the view that held all interactions to be involved with material objects was quickly disabused by advancing discovery. It is now well established that there are fields which are wholly nonmaterial. Quantum mechanical interactions of physical psi fields are, in a subtle way, nonmaterial, yet they are described by the most important and the most basic equations of present-day quantum mechanics.

As early as 1931, Eddington (2) had indicated that the mind has "by its selective power fitted the processes of nature into a frame of law of a pattern largely of its own choosing; and in the discovery of this system of law the mind may be regarded as regaining from nature that which the mind has put into nature." While this view might well be considered speculative, in 1937 Jeans (3) had indicated the wide measure of agreement among the sciences, almost approaching unanimity, that the accumulation of knowledge of the physical sciences was heading toward a nonmechanical reality, and that the "universe begins to look more like a great thought than like a great machine."

Hubbard (4), in establishing in 1952 basic concepts for scientological thought, indicated that if life (Life) is a mirror and a creator of motion which can be mirrored, it follows then that mirror-wise, the whole of the laws of motion can be found in thought and behavior, and even thinking partakes of the physical universe laws regarding matter, energy, space and time. In essence, Hubbard was led to postulate in addition to the usual physical concepts an additional aspect which he labeled "theta"--or thought--and which follows definite laws, to account for life phenomena. It was his opinion that such an extension was necessary in order to express in its totality the animate as well as the inanimate world of matter in motion. (5)

Writing in 1952, Pauli (6) felt that the psychophysical parallelism envisioned in the last century could not account for the general problem posed by the relationships of mind/body, by the inner and outer, and that modern science, by introducing the concept of complementarity into physics itself perhaps had indicated a more satisfactory solution if mind and body could also be interpreted as complementary aspects of the same reality.

In his Chicago lectures in 1929, Heisenberg (7), in reviewing the fundamental principles of quantum theory had indicated that although the theory of relativity makes the greatest of demands on the ability for abstract thought, nevertheless it fulfilled requirements of traditional science. It permitted division of the world into subject and object (observer and observed), and hence a clear delineation of the laws of causality. However, in quantum theory, where in classical physical theory it was assumed that observer-observed interaction was negligible, this assumption was not permissible in atomic physics, since the interaction between observer-observed caused large or uncontrollable changes in the system being

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observed. Heisenberg (8) indicated subsequently that down at the atomic level, the objective world in space and time no longer existed. Further, the mathematical symbols of theoretical physics referred merely to possibilities and probabilities, not to facts.

By 1952, the time of Hubbard's major theoretical production, it had become well established in science in general, at least in theory, that in terms of quantum physics, concepts concerning absolute space and time as well as causality had to be abandoned. (9) Further, the classical concept of material substance was no longer upheld, since atomic particles did not possess the unambiguous nature of the solid bodies of the macroscopic world.

With the physical sciences grappling with this vacuum, Hubbard felt it necessary to interject a metaphysical premise, which became the basis of scientological thought. He introduced the concept that the considerations which the conscious or psychic entity holds take rank over the mechanics of space, energy and time. Since this was by observation obviously not the usual case, he suggested (10) that the individual was in an inverted state, and that the primary goal of scientology would be to bring an individual into such thorough communication with the physical universe that he could regain the power and the ability of his own postulates. He indicated that the mechanics of the physical (and eventually the mental) universe are the products of agreed-upon considerations which life mutually holds. According to this line of thought the reason we have space, energy, time, objects, etc., is that life has agreed upon certain things, and this agreement has resulted in a solidification. Our agreed-upon material is then quite observable.

In 1953, Eccles (11) wrote that in practical life all sane men assume they have the ability to modify and control their actions by the exercise of will. There was, he stated, no doubt that a great part of activity from the cerebral cortex is stereotyped and automatic. But he contended that it would be possible to assume voluntary control of such actions. The neurophysiological hypothesis would be that the "will" modifies the spatio-temporal activity of the neuronal network by exerting spatio-temporal "fields of influence." Since such mind-influences have not yet been detected by any existing physical instrument, they have been neglected in constructing the hypotheses of physics.

These "mind-influences" have not been neglected in the scientological system, however. Hubbard (12) indicates that the aspects of existence when viewed from the level of man is a reverse of the greater truth above, for man seems to work on the secondary opinion that mechanics are real, and that his own personal considerations are less important than space, energy and time. This, he suggests, is an inversion. He further indicates that the freedom of an individual depends upon that individual's freedom to alter his considerations of space, energy, time and forms of life and his roles in it. If he cannot change his mind about these, he is then fixed amidst barriers such as those of the physical universe, and mental barriers

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of his own creation. Thus, he is generally impotent in many respects in handling his existential environment.

Koestler (13) in 1945, indicated that volition, in its psychological aspect, may be the interplay of impulses and inhibitions. If this interplay takes place on the conscious or, as Hubbard suggests, on the higher sensory functional level, it is experienced as a process of choice, and the subjective experience of freedom becomes stronger the closer the process is to the focus of attention. It is further indicated that the experience of freedom resulting from processes in the focus of attention is probably synonymous with consciousness itself.

In establishing conceptual scientology, Hubbard proscribed two distinct divisions in scientology. The first is philosophic; the second is concerned with technical aspects, these being the ordered processes and psychophysiological feedback techniques derived from research to restore to the individual the conscious process of choice, both in terms of himself and in terms of his familiarity, thus, cause, with the physical universe. Any other condition of existence, Hubbard suggests, contributes to a less than self-determined existence in a physical universe which is the inevitable average of illusion.

The end point of the dianetic and scientology rehabilitative processes is considered to be the ability to be conscious and causal in any desired direction of activity, and thus has implications for the development of alternative future histories in which psychoenergetic factors may play an increasing role.

This present paper will contain a description of relevant scientological philosophic factors, as well as certain technological processes, and will include descriptive data on certain scientological concepts which do not as yet have correlations in other fields of inquiry. The concluding discussion will indicate certain potential directions for scientological applications.

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ERASURE OF SUBCONSCIOUS MIND

[Paper by Bernard Green, doctorate and fellowship, International Awareness Center, New York, New York, in English]

[Text] To prove that the negative aspects of the subconscious mind can be totally erased, and a new state of creativity will emerge as a result of being free from the hindrances of his past.

This individual would have the following attributes:

a. Ability to do new things;

b. Fast reaction time;

c. Near accident-proof;

d. No ills of a psychosomatic nature;

e. High self-mastery;

f. Creative and constructive character;

g. A search for different viewpoints in order to broaden individual reality;

h. Powers of extrasensory perception.

Cases To Be Discussed

a. An individual who was previously institutionalized, who was cured of schizophrenia.

b. A neurotic person who had sexual obsessions and is now living a happy normal life.

c. A case of one who was cured of ulcers and diabetes.

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d. A cancer patient who was completely cured.

e. An individual whose creative potential was developed.

Composure of Subconscious Mind

The subconscious mind is composed of two things, mental mass and significance. The mass is a collection of energy particles that together with the significance placed on them, constitute the pain and unconsciousness of an individual's past. The pain and considerations of these moments are brought forward in time and result in negativity.

These encysted traumas are frozen in time and are magnets for attention units. When the individual puts his attention on these traumatic incidents, he identifies the pain and feelings of the past as happening now. This results in pain, mental unconsciousness, unawareness, negative feelings and attitudes, which manifest themselves in terms of distrust and unkind thoughts.

These past incidents force the individual to think in terms of identities and association rather than differentiations, and aberrated behavior and irrationality come about.

In addition to past traumas, there are harmful acts, which the individual commits and justifies. These justifications are secondary postulates (lies) and force the persons' attention on the pain resulting from the detrimental act he has committed, with the result of further interiorization into the past.

Traumas and harmful acts are the two most basic factors in the human psyche which inhibit the development of extrasensory perception.

A negative postulate or consideration is always preceded by a harmful act and the negative postulate is the effect of the justification, or is the actual justification for the harmful act, and remains so because it is a lie.

A series of justifications create the feelings of guilt. There exists an unconscious desire for the scales to be balanced, in the form of a similar act done to the individual.

Creation of circumstances whereby a similar act is committed and, thus the cycle continues, until justifications are thoroughly viewed and the cycle of karma.

Problems

Each problem is a postulate counterpostulate, and is so because of a basic intention, counterintention, which relies for its mass and significance on an earlier traumatic incident.

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Each problem the person has is, of course, basically his own creation, and when the individual takes responsibility for sane it tends to disappear.

If there is a persistent problem of long duration, it is so because it is not the real problem, but either a secondary problem which is too painful to confront, or because this is in fact a solution to an earlier problem.

A problem will erase if it is thoroughly viewed in all its complexities.

There are many ways of achieving this, all of which will be submitted to the congress.

Over 75 percent of present-day illnesses are psychosomatic.

It can be shown that when the human body has a psychosomatic illness it is actually physiologically insane. Physiological insanity is living in the past rather than the present. One technique of relieving psychosomatic illness is by putting the person's body into actual contact with the present environment.

Psychosomatic illness is rooted in early traumatic incidents of pain and unconsciousness. There are generally grouped in chains of traumas and are held together by a feeling, rather than a significance. These incidents are generally of a karmic nature, in that there is a chain of incidents that have been committed against the patient, and in parallel are similar (in terms of feeling) chain of traumas which the individual has committed against others. It will be shown that when these types of incidents are thoroughly viewed they erase in terms of their mass and significance and the psychosomatic illness immediately starts to disappear.

The following case histories will be discussed:

a. A case in which the patient's good eyesight was restored;

b. A diabetic patient cured;

c. A cancer patient cured;

d. A hypoglycemia patient cured.

Man today, is an aberrant species, thinking in terms of identity and association.

His true potential is creative and enormous and can be reached by:

a. Erasing those traumatic incidents which are attention magnets;

b. Eradicating those harmful acts which are shrouded in justifications;

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c. Releasing those negative postulates which create problems.

A formula of postulation is:

a. Intention + expectation = postulation;

b. Intention - expectation = hope;

c. Expectation - intention = prediction.

By these techniques a superior human being can be helped to evolve and extrasensory perception becomes a natural facet of one's individual power.

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FROM EXTERNAL TO INTERNAL CONTROL WITH BEHAVIOR MODIFICATION

[Paper by Frances E. Cheek, Ph.D., New Jersey Neuropsychiatric Institute, Princeton, New Jersey, in English]

[Text] The techniques of behavior modification are frequently associated with the mechanistic human engineering of Orwell's "1984." However, rather than emphasizing external control, as in token economies, we are currently developing at the New Jersey Neuropsychiatric Institute experimental treatment programs aimed at eliciting greater self-control on the part of the patients. A basic 4-week behavior modification training program, consisting of eight 1.5-hour sessions, which includes instruction in techniques of relaxation, desensitization, self-image improvement, behavior analysis, behavior control, assertive training and rational thinking, has been developed. The program has been adapted for use with drug addicts, alcoholics and acutely mentally ill patients as well as their families and staff working with the patients. Pilot programs have generated promising preliminary research findings as well as considerable participant enthusiasm. With the achievement of greater self-control on the part of patients, through these programs, it is hoped that the complicated and difficult transitions in life style involved in going from heroin addiction to methadone maintenance, from problem drinking to abstinence, or from mental hospital to the community for the mentally ill patients, will be facilitated.

This use of behavior modification techniques to facilitate inner control parallels recent developments in psychology in which states of meditation, biofeedback training and imagery are now being used to enhance man's awareness of his mental potentials and his ability to control his mental and physical functions as well as the circumstances of his life.

This work began in 1967 with a 10-week training program in which 14 families of convalescent young adult schizophrenic patients were taught how to handle the disturbed and disturbing behavior of their ill family member by the systematic application of rewards and punishments. Training techniques included lectures, movies, group discussions and role playing. The success of this program encouraged us in 1969 to develop a similar program for wives of convalescent alcoholics, aiming now at altering the destructive

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interaction we had previously observed in a study of the therapeutic use of LSD with alcoholics.

In this program we quickly found that the tension, bitterness and resentfulness of the wives made analysis of the consequences of their own behavior impossible. We, therefore, decided to initiate procedures of relaxation and desensitization to aspects of their interaction with their husbands. These measures proved quite popular with the wives and also their husbands, many of whom now began to attend the program.

This led us to develop a new program which included hospitalized alcoholics and their wives in which we worked for 5 weeks with husbands and wives separately while the men were still hospitalized, and for 5 weeks with both together in joint sessions after the husbands left the treatment unit. The program now included training in relaxation, desensitization, how behavior is influenced and how it may be controlled. However, self-image and assertive training were also added at this time as we felt these would be appropriately useful for both husbands and wives. This program, after an encouraging experimental phase, became part of the regular program of the alcoholic unit.

At this time we began to recognize that, quite unintentionally, we had shifted our attention from training participants in behavior modification techniques in order that they might develop better control of others , to training them to have greater control over themselves . We now decided to try out the program with drug addicts hospitalized at the institute, while undergoing build-up for methadone maintenance. We felt it would help the addicts to cope with problems of tension, low self-image, poor future orientation and inappropriate assertiveness, which we had noted in a previous study. We revised the training to take place in 4 weeks with two 1.5-hour sessions per week, putting the various materials--lectures, techniques, playlets, etc.--into a workbook and adding pictures and poetry, some of which was contributed by the patients, to enhance its attractiveness as well as clarify its message. In a pilot program we trained 43 addicts, with remarkably encouraging findings in terms of highly significant changes in general level of tension, self-control, self-image and degree of assertiveness.

This program proved exceedingly popular with the addicts, and many requests from staff at the institute, as well as outlying methadone clinics, probation offices, etc., led us to revise the workbook for training staff, maintaining the training in techniques as before but orienting the material to staff instead of patients. We also added a first meeting called "Overview of Behavior Modification" and a last meeting, "Instructions in How to Set Up and Run Staff and Patient Behavior Modification Training Programs."

In late spring and early summer of 1972 we successfully conducted three intramural training programs for the staff of the Drug Addiction Treatment Center at the institute, training 37 staff members. From 17 May to

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21 June 1972 we also ran an extramural training program for staff from outlying methadone maintenance clinics, etc., in New Jersey. For this program we held five all-day meetings once each week, consecutive Wednesdays. We also set up a monthly review session with those trainees who wished to return for a morning session of review of their on-going work with behavior modification, and an afternoon seminar with distinguished speakers in the area of behavior modification to further their training. A monthly newsletter was initiated to keep trainees informed of further developments in our own and other training programs and to present them with other material we felt would be useful and relevant to them.

To date we have conducted four extramural training programs for staff members working with drug addicts. Further, we have revised the staff training workbook to make it suitable for staff working with alcoholics and with mentally ill patients. Both an intramural and an extramural training program for staff working with alcoholics have been carried out and more are planned.

The program developed for drug patients has now been rewritten for alcoholics and for mental patients. The program for alcoholics has been operative since June 1979 [sic]. A program for young adult mentally ill ran all summer and a program for adult mentally ill is now in operation. All the programs are in a research phase; pre- and postprogram data as well as 3-month evaluation data are being collected. However, preliminary findings appear very favorable.

At present our basic workbook is being rewritten to apply to families of drug addicts, as well as families of alcoholics and families of mentally ill patients. It is our observation that only if all four groups are included in behavior modification training--the patient, his family, and both inpatient and outpatient staff working with him--will these programs achieve their maximum effectiveness. If patients, their families, and inpatient and outpatient staff are similarly trained in the techniques of relaxation, desensitization, self-image, behavior analysis, behavior change, assertive training and rational thinking, a common language and a common set of tools are available for each to deal with one another in a rational, effective and constructive way. These tools should help the patient in his problems of adjustment, help the family to deal with their own and the patient's problems in the home, help the hospital staff to deal with problems in interaction with the patient, and help the outpatient staff in their work with the patient on his problems of community adjustment.

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A HOLOGRAPHIC BRAIN MODEL

[Paper by Eugene Dolgoff, City College of New York, New York, New York, in English]

[Text] Introduction: The author has been involved in holographic research for the past 9 years. Work done with R. Stirbl, and more recently, R. Virga and M. Metz, has been aimed at reproducing analogous brain functions with high integrity. The successful production of a holographic brain model would result in capabilities of faster, higher capacity, and more accurate memory, sensory perception, learning, decision making, recall, and overall thought processes. It would provide an alternative to diseased or otherwise impaired or destroyed receptors, nerve systems, and brain centers. Besides being a boon to communications and psychotherapy, the many potential applications of holography will benefit from the understanding of such a working system.

The Hologram: Basically, the hologram is just a recording of the superposition of two or more wave fields which, being present at the same time, are permanently associated with each other (see Figure 1). The reapplication of one of the fields generates the phase relationships of emerging light wave fronts which are the other associated fields. The information is spread over the entire hologram so any part can reproduce the entire image. Each holographed object has different spatial frequencies associated with its feature spacings, making the hologram a fourier series of periodic feature correlated fringes.

Previous Supportive Work: As Lashley, "... certain coordinated activities (relating to visual as well as motor reactions) ... can be carried out by any part (of cortical areas) ..." and Pribram, "subtotal removals of brain tissue, regardless of location within the input systems, interfere remarkably little with perceptual recognition processes ... (and) memory ..." have noted, along with Wilson and Mishkin (1959), Galambos (1967), Kao Liang Chow (1970), and others who have performed major cortical and optic tract removals, that such removals "leave the patient or experimental subject's perceptual abilities remarkably intact over long range." Attempts at electrical brain insulation, short-circuit, and epileptiform discharge

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with right hemispherical receptors and functions. This has resulted in inability to verbalize left hand contacts and so on.

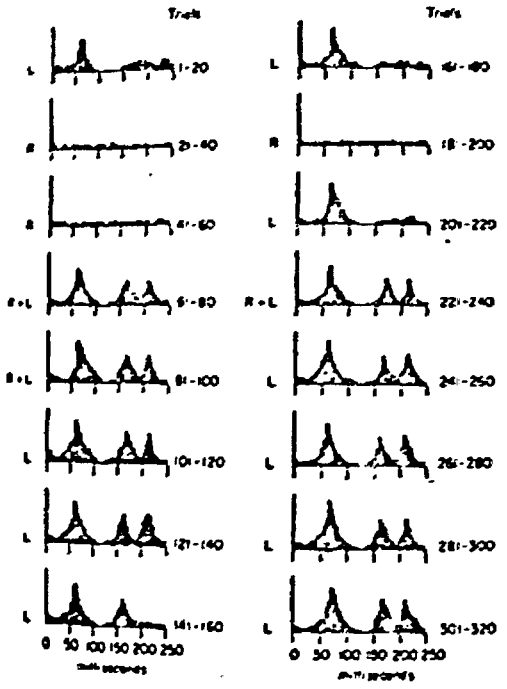


Figure 2. Change in response of cortical unit brought about by pairing test flash to left (L) and right (R) eyes, shown in poststimulus histograms. Note that after pairing of RL for 40 trials, L alone continues to elicit new response pattern for about 60 trials before resuming initial pattern. Repetition of pairing causes effect to persist from trials 240-320. Once (L) and (R) stimuli associated with enough holographic storage, the introduction of one reconstructs the other (John).

A holographic system will be constructed in our laboratory taking these and other brain hologram theories into account to show model feasibility.

Many distinctive and remarkable capabilities of living organisms, especially human, are normally quite difficult or impossible to explain without a holographic model and yet are fairly straight forward with one. These include positive recognition of a person in a crowd, vast recall about him, contour sensing, image constancy, observance of slight scene variations, and imaging through phase distorting media--analogous to dissociated learning under a specific drug (Overton, 1972). Under certain conditions (drugs, hypnosis, sensory deprivation) reconstructed imagery can be indistinguishable

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from perceptual imagery, creating effects such as [illegible], apparent astral travel, illusions, phantom pain, hallucinations, etc.

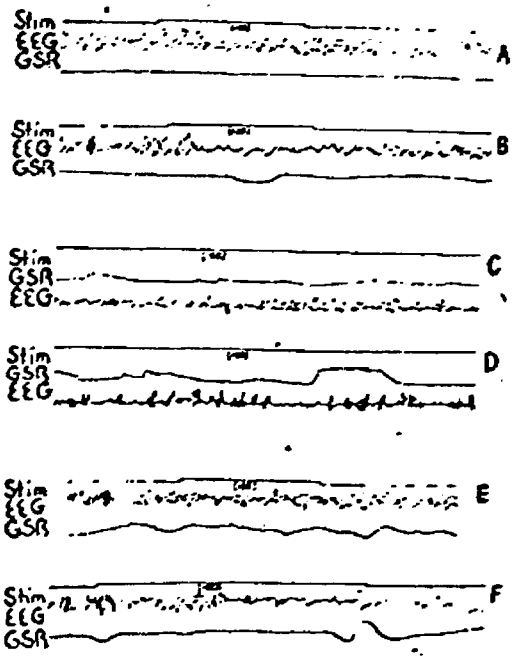


Figure 3. (A) Habituated response (EEG and GSR) to stimulus intensity arbitrarily indicated as 160. (B) Dishabituation (orienting) when stimulus intensity is lowered to 120. (C) Same as A. (D) Orienting to the shortening of the stimulus duration. (E) Same as A. (F) Orienting to the unexpected lengthening of the stimulus duration. Note that GSR is also delayed. This is due to the sluggishness of the autonomic nervous system. From Sokolov, 1960.

Information and events are better remembered when they occurred at a common time. In the lab we have found this to be due to coherent superposition of stimulus fields.

Ultrasonic holography, using sound, is capable of the same traits, fitting the holographic model. Echo-locating animals such as bats, porpoises, whales, and certain birds are constructed to generate an internal reference for holography (see Figure 4) which is the only way they can perform such fine maneuvers and differentiations (Ayropetyanc, 1967).

Where Are the Engrams? The location and mechanism of engrams (memory traces) is understood as generally nonlocalized, but holographic research

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does not implicate specific systems. In evaluating alternatives set forth by neuropsychologists, neurophysiologists, and neurobiologists, favored hypotheses can only be selected on the basis of holographic recording requirements. Storage must utilize the many methods of holographic multiplexing such as use of varying spatial and temporal frequency carriers. Although most holograms are recorded on materials with varying contrast latitudes, binary holograms reproduce the same continuous tone images. This consideration is useful when postulating the materials for neuronal storage (neurons are binary, all or nothing, devices). More likely sites for storage than neurons are neuronal synapses, 10^4 to 10^5 times more abundant. Newly discovered, neurosecretory neurons stand to increase storage capacity by varying firing potentials of other neurons. Candidates for recording are membrane macromolecule lattices (lipids, proteins, and other anisotropic macromolecular orderings), cortical column or other neuronal cell assembly organizations, functional microstructures of slow potentials (Pribram), RNA (McConnel, 1970), polypeptides, lipoproteins, and mucoids (Bayoch, 1968; Glassman, 1967), neural transmitter substance inhibitors (Deutsch, Hamburg, and Dahl, 1966), and various modified combinations. Neuronal impulses travel like waves "through possibly 100,000 neurons per second" (Eccles, 1958), through three-dimensional neuronal networks (best for largest holographic store--10 billion bits stored in one cubic centimeter--La Macchia) (Heerden, 1968). Lateral interactions due to inhibitory interactions by slow potential hyperpolarization affects the discharge rates of optic units (in the optic nerves) neighboring on excited units. Although wave-like propagation is present in record and retrieve transmissions, it is not essential for hologram formulation (computer-generated holograms--Lohman). In holographic retrieval, no selective scanning or "keeping track" techniques are required. The entire store is addressed by the specific reference and only correlates with the proper information. To reconstruct neural holograms, incoherent inputs can stimulate coherent impulses which can then superpose as necessary (as in coherent radar). A coherent spherical (or symmetric) reference need not be stored or generated in attempted coherence with stored information, but can be derived from proper fourier (spatial) filtering and shaping of the information itself. An analogous process to Bragg reflection can also incoherently retrieve stored coherent information. Incoherent self-correlation (Lohman) can carry out the entire coding and encoding steps necessary for holographic processes without need for an incoherent-to-coherent transition.

Most definitely, even though shapeless references can reconstruct information (Delgado), objects or bits of information alone are correlated with one another producing a truly associative memory--information or perception (or internal duplicates) are necessary to reconstruct any other stored information (Figure 5). [Figure not reproduced]

These processes could be used in combinations for optimum capacity, speed, and accuracy under less stringent conditions.

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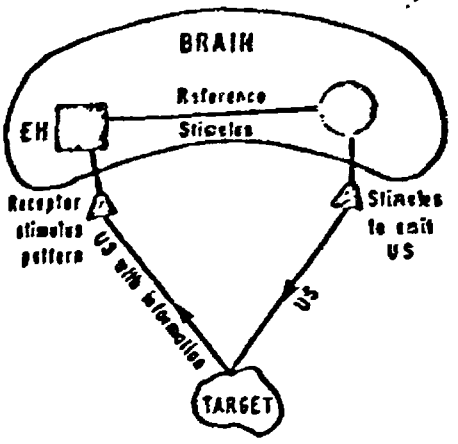


Figure 4. Bat Brain System for Internal Referencing to Produce Holographic Storage, Retrieval, and Discrimination (Ayropetyanc)

Conclusions: A holographic model of the brain has been described and detailed in many areas based on experiments done by the author and his coresearchers at the City College as well as on the reported research of other neuropsychologists, neurophysiologists, neurobiologists, and holographers. Holographic devices and systems are being constructed for brain model feasibility and the aims stated in the introduction.

The holographic hypothesis does not upset classical neurophysiological conceptions, but fits in with detailed findings. It enriches psychology by providing a plausible mechanism for understanding phenomenal experience.

"For the problems of perception, especially those of image formation and the fantastic capacity of recognition memory, holographic description has no peer." Pribram, 1971.

PHOTO CAPTION

5. p 197. "Ghost imaging"--reconstruction of holographically stored information by illumination from one of the object beams. The horizontal object is reconstructed since it was associated with the vertical one during recording. (Collier, Burkhardt, and Lin.)

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EYELESS VISION TRAINING

[Paper by Yvonne Duplessis, docteur es lettres de l'universite, Paris, France in English]

[Text] Our research into synesthesia led us to engage in an investigation with subjects who had become blind. From 1966 we studied the role of tactile sensations in GESP and especially in the transmission of colors (Rev. Metapsych. 1966, Nos 1.4 - 68 No 11 The Journal of Parapsych. 1970 No 4) From pilot tests it appeared that some colors are better received than others, the frequencies being: yellow 45 percent, red 29 percent, blue 21 percent and green 7 percent, compared to an uniform sending of 25 percent. This order is different from the one of the sighted subjects.

Let us recall that it has been established by R. Hardy and R. Warcollier that the decreasing order of GESP with sighted subjects was: red, green, blue and yellow.

We compared this last order with the one established by the physiologist Ch. Fere according to dynamometrical pressure induced by the colors which his subjects were looking at (Sensation et Mouvement 1887). Their muscular contractions were the strongest for red and green and decreased for yellow and blue. Thus it can be said that every sensation, even GESP, has physiological effects.

Then we investigated if variations of intensity, kind, direction of light and changes of colors of the environment might induce feelings on blind people. Since 1971 we have been engaging in research on eyeless vision with individual subjects with the help of grants of the Parapsychology Foundation Inc.

Effects of Light and Colors of the Surroundings

Let us recall that the forerunner of research on eyeless vision was Jules Romains of the Academie Francaise. On 23 April 1971 he honored us in coming to one of our experiments at the Centre d'Eclairagisme of which Mr Deribere, President du Centre d'Information de la Couleur, was kind enough to lend us the room for visual trials. The walls can rotate on themselves, thus changing their colors and light tests might be done.

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Seventeen subjects were tested, 11 of them were totally blind of which 10 had the most characteristic feelings. Only a subject with black skin had no feeling at all. The six other subjects (2 color-blind, 2 nearly blind and 2 not blind, but blindfolded) did not succeed the color test well.

The difference of intensities which could vary from darkness to 5.000 lux and the kinds of light (fluorescent or incandescent) were felt more easily than colors. However 1.000 lux was confounded with darkness. Incandescent light seemed darker and warmer than fluorescent and directions of light were well enough located. Colors induced the following feelings: White-grey: Clearness - Extending throughout the room; Dark-green-blue: Colder-Space-Dispersed resonance; Red-Salmon: Warm-Reduced space - Velvet sound.

In the darkness colors induced no feeling. It seems that 1.000 lux and fluorescent light were the best conditions to feel the colors of this room of 20 m2 and 3,20 m high, in the middle of which the subject sat.

Twelve subjects "recognized" the colors by giving out the same feelings: white-grey in 70 percent of the occurrences, blue in 60 percent and red in 50 percent. Let us state that the colors we used had the same saturation. It was confirmed by the fact that a "light-probe", apparatus for blind which gives out a varying pitch according to color saturation variations, gave constant response.

Paroptic Vision

It appeared to us that eyeless vision by the face must be distinguished from the one by hands. The first one is related to white and black cards and to graphic shapes. The second one to feelings especially to those induced by colors. It is called dermooptical sensibility by Professor Novomeisky and his collaborators. Thus we will share our first observations in two parts: paroptical vision of black and white stimuli and of colors by face and dermo-optical sensibility of colors by hands.

Five of our subjects were blind, one was nearly blind and was trained with eyes blind-folded like another who is very short-sighted. They were about 26 years old except a blind sculptor J. B. and the nearly blinded I. G. who were about 60. The blind lost sight in their childhood and J.B. 30 years ago. They were students or artists. I. G. was a writer.

1. Black and white stimuli

a. Blind: The subject sat before a window in daylight and the experimenter in front of him held a card without looking at it. The first exercises were the detection of geometrical black shapes on white cards or of 1 to 9 black dots stuck on white cards. These exercises trained the subject to the letters reading. The left side of the face is the most sensitive and subjects begin to visualize paroptical flashes.

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Then J. M. was trained to distinguish vowels. They were printed in black on white cards. They were easier to detect when two of them were presented simultaneously to the subject. When both were the same the subject could "see" them easily. The A was the most frequently recognized and the E with the most difficulty. The general shape was perceived first and then a letter after two minutes of a very great attention. The subject preferred that the experimenter moved the cards in front of his face.

b. Nearly blind subject: From October 1971 till August 1972 we trained a woman I. G. twice a week. After a relaxation paroptical-vision exercises were done and after another relaxation dermo-optical sensibility was trained.

We added to the first test: the paroptical vision of objects. She analyzed her different feelings: metallic taste for scissors, light and shadows for three-dimensionality, different colors and so on. Then she detected one object among five known to her. They were in plastic boxes, on a white or black paper which she got accustomed to detect. The experimenter moved the box in front of her face.

For the subjects the paroptical perception seemed to happen in a fog of which emerged unshapely lines. The subject must try to grasp them and was helped by motions of the targets or of her head. The concentration was very tiring. When the palms of the hands were turned toward the stimuli they reinforced the paroptical-vision.

In December the subject "read" some words. Letters were assembled in a word like: "cri," "raie," "soir" under a plastic voer. I. G. began to catch a frame in which she located the number of letters. Then she distinguished: lines, angles, curves, then the first and the last letters, then the others.

Unfortunately this subject was not in good health and after a heart attack at the end of January and bronchitis in April her ability declined. In order to help her to recover it we trained her at electric light to paroptically "see" white cut plastic letters (10 cm high) fixed on a black plastic board at 50 cm in front of which she sat. Then she began to distinguish some letters one after another.

c. Non-blind subject: Since July 1972 our assistant and I trained a paralyzed young man with blind-folded eyes to distinguish black from white plastic cards with an inequal repartition. He detected 207/260/. Since December he has detected black, grey and white cards. 90 trials have been done. There were 62 right responses: 30/39 white cards, 19/32 grey cards and 13/28 black cards. It seems they were detected by their difference of lightness; in this case thermal hyperesthesia might be involved.

2. Colors. Daylight, Blind. They began to perceive differences between contrasted colors such as red and white; yellow and green without naming the color, O. M. perceived with the left temporal. The feelings were: white: unpolished, tiring - Blue: tiring, visualization - Green: cold - Yellow: visual vibration - Red: warm, visual.

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Electric light test. Nearly blind subject. On a switchboard 70 cm high, 42 cm large are five vertical rows with 8 blue, yellow, transparent, red and green electric lights, each of the rows (25 watts) was lighted in a dark room by the experimenter. The subject sat at 1m60 from the board and indicated her feelings and the color. The left temple was the most sensitive. The forehead middle was blind. Cold colors did not seem to blink as warm colors did. Transparent and red were confounded.

Electrically lighted plastic plates. In a plastic box were 6 lights (15 watts in all). Colored plastic plates could be the covers. Thus they were lighted underneath. The subject sat before the box; her head at 30 cms above it. Transparent was confounded with lilac and white. White induced a continuity feeling, unpolished. Yellow had a different warmth than red. Orange warmer and thicker than yellow was confounded with red. Red was recognized easily by inducing pulsations like palpitations. Green and black induced no feelings and were recognized by this way but confounded. With training I. G. could distinguish green from black with her hands at 20 cm above the plate. Green induced motion around her hands.

This confusion of black and the emerald green was the most interesting. Tested with the light-probe we found that as more than 30 cms above the green plate its sound stopped. For the other plates, lilac included, it pitches till 2 meters above them. Thus it seems there is a paroptical perception of some colors different from normal vision.

Dermo - Optic Sensibility

Daylight

a. Blind. It looked not as tiring to feel colors by direct contact as at a distance from the face. The subject examined the card with his left index and confirmed his feelings with the right one. The detection was faster than with the face. In the beginning the subject was not asked to name the color but he must hand-pick two colors in a deck. For instance he might separate yellow from black or green cards, red from green or white cards which were unequally distributed before him. Then cards were put in plastic covers or under a glass. O. M. distinguished yellow easier than black. However J. B. distinguished red from white easier than from green. Blue was the only color he visualized weakly. According to J. M. colors were seen like in a fog where they formed contrasted blobs. Plastic covers gave them bright reflection. It was a help or a difficulty according to the different subjects.

J. M. located his feelings on his hands. Blue in his left palm and green above this hand. Yellow in the right palm and red above this hand. In the following is indicated a scale from cold and smooth to warm and rough feelings. Blue: fresh - White: tiring, unpolished confounded with yellow and black - Green: cold, very smmoth - Yellow: not so smooth but smoother and colder than black. Vibration of light. Yellow is between green and red. Red is rougher as if a hand brushed an animal fur the wrong way.

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Then J. B. was asked to deal 25 colored cards of five times each colors that he might feel with his hands. Tests were done with different experimenters.

	Blue	Green	Yellow	Red	White	Total
Ideal score	80	80	80	80	80	400
Average (random)	16	16	16	16	16	80
J. B. score	26	23	15	19	21	104

Green and blue were detected better than yellow

b. Nearly blind subject. We began to use colored cardboards of 17 x 22 cm. The right hand was more sensitive than the left and the palm and fingers extremities. Then we used colored plastic plates of 9 x 9 cm. The subject gradually began to recognize the colors by comparison with one of which she was sure of, for instance, red.

She used two criteria: 1) Red plastic plate seems to be thicker than the others as the edge of a book. 2) Her hand positioned itself at a certain hight above the plates: 13 cm for red, around 15 cm for black, 20 cm for yellow, 23 cm for blue and anywhere for the very light green, blue and white.

Dynamometrical Reactions

We registered the dynamometrical reactions from two blind subjects and from the nearly blind without knowing, then knowing the color placed before them. We indicate the relative numbers of their pressures.

Without knowing colors

	Blue	Green	Yellow	Red	White	
Blind: J.B.	64	61	66	61	59	right hand
M.L.	15	16	22	18	20	left hand
Nearly Blind	26	30	18	39	20	right hand

Knowing colors

Blind: J.B.	64	64	62	68	62
M.L.	15	16	13	20	10
Nearly Blind	25	31	35	48	18

For the blind subjects the strongest pressure was for yellow and, for the nearly blind it was for red, when they did not know the color. In the other case it was for red for the three subjects as for sighted subjects.

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Let us add that from a comparison with the colors time reactions it appeared that for J. B. it was slower for the stronger dynamometrical pressures in the two cases, i.e.: for yellow and then for red. For I. G. it was faster for red in the second case only.

Conclusion

From these first investigations it appears that there was a paroptical vision of white and black cards or shapes and of colors by different parts of the face. The left side is the most sensitive. This ability requires a great attention and the subject must be in good health and free of worry.

According to the paroptical vision for colors it seems that in daylight the saturation differencies are perceived. With electric light, green and black are confounded. Red induces pulsation feelings.

The dermo-optical sensibility is not so tiring to be trained. Colors induce thermal and density feelings. Red attracts the subject's hand.

The eyeless vision training seems to make subjects aware of abilities that normal sight prevent to feel.

We hope that, when compared to research conducted in other countries, especially in USSR, they will open new directions of investigation.

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STUDIES OF PSI-FACILITATING STATES: HYPNOSIS, MUSCULAR RELAXATION, AND AN EXPERIMENTALLY INDUCED HYPNAGOGIC STATE

[Paper by William G. Braud, PhD, University of Houston, Houston, Texas, USA, and Lendell W. Braud, MA, Texas Southern University, Houston, Texas, USA in English]

[Text] The authors are engaged in a long-range, ongoing research program in which physiological and psychological states conducive to the psi process (so-called "estrasensory perception") are being explored. In this paper, we report the results of eleven experiments which have already been completed in our Houston laboratories.

In our first experiment, a subject in a hypnotic state attempted to receive psi impressions of the sensations and thoughts of a sensorily isolated agent during a 15-minute period on each of 5 days. Naive judges attempted to force-match the five recorded and time-indexed subject protocols with the five recorded and time-matched agent target protocols. All judges were able to determine the correct correspondences with perfect accuracy ($p<.01$). Not only was the subject able to identify correctly the target content for the given days but also was able to show correct time correspondences within each daily session. In considering what feature of hypnosis might have been responsible for such dramatic correspondences, the strong relaxation component of the state suggested itself as an important factor. Several other independent lines of evidence also suggested that physical and mental relaxation may be quite favorable to the occurrence of several psi phenomena. These converging lines of evidence include the following: (a) relaxation seems to be a reliable characteristic of the percipient in a majority of cases of spontaneous psi phenomena, (b) reference to the importance of relaxation is found in the writings of and about nearly all gifted psychics, (c) Rhea White, in her classic study of the introspective reports of gifted subjects which have appeared in the experimental literature, has pointed to the critical role attributed by these subjects to deep physical and mental relaxation, reduction of strain, increase in passivity, and stillness of mind, (d) relaxation is an important ingredient in nearly all recipes for effective psi functioning as taught in psychic improvement courses, both formally and informally, (e) autonomic nervous system state measures which have been found to accompany

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facilitated psi closely resemble physiological syndromes traditionally associated with relaxation, (f) EEG indications sometimes associated with enhanced ESP performance suggest an electrical correlate of the subjective state of relaxed awareness and of the physiological state of muscular relaxation, (g) the dream state so successfully exploited as a psi-favorable condition by the Maimonides group in recent years is characterized by extremely low muscular tension, (h) slowed alpha (alphoid) rhythms characterized two out-of-the-body experiences (which are sometimes accompanied by psi) studied in the laboratory, (i) alpha predominance characterized certain meditative states which have traditionally been associated with heightened psychic sensitivity, and (j) Schmeidler obtained good psi results in her studies of relaxed and passive maternity and concussion patients.

Thus, in our next seven experiments, we induced a state of deep physical and mental relaxation in our subjects using a modification of Jacobson's progressive muscular relaxation technique. Subjects in the relaxed state attempted to gain psi impressions of colored target pictures being sensed concurrently by an agent sensorily isolated from the subjects. All possible conventional sensory cues were eliminated before, during, and after the impression periods through the use of proper experimental techniques. Correspondences between subject protocols and actual targets were rated (blind) by the subjects themselves and by naive judges who were unaware of the correct targets at the time of rating. In these preliminary relaxation experiments (the results of which are presented in Table 1), subjects' impressions matched the correct targets at a significantly higher level than they matched five alternative control pictures which the agent did not "send." These correspondences could not have been due to sensory cues, rational inference (since targets were selected randomly from a large pool), or coincidence, and therefore indicate the successful operation of the psi process.

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Table 1

Summary of Results of First Seven Preliminary Relaxation Experiments

Experiment	Condition	Cases	% Hits	Misses	Hits	P	Direct Hits	% Direct Hits	P
1	Repeated tests of Single S	6	6	0	100	.001	6	100	.001
2	Individual tests of six Ss	6	6	0	100	.001	6	100	.001
3	First group test	10	10	0	100	.001	7	70	.0002
4	Second group test	11	10	1	91	.006	6	54	.004
5	Third group test	10	4	6	40	n.s.	2	20	n.s.
6	Fourth group test[1]	6	4	2	67	n.s.	1	17	n.s.
7	Fifth group test[2]	11	11	0	100	.001	4	36	n.s.
Noncorrected Total (see text)		60	51	9	85%		32	53%	
Corrected Total (see text)[3]		22	19	3	86%	.001	13	59%	.000007

[1] Smaller group with reporter present

[2] Long-distance experiment (Los Angeles to Houston)

[3] These figures are not corrected for a possible stacking effect. See p. 39 for this correction.

In our ninth experiment, we began to explore the role of relaxation in a more analytical fashion. Subjects were tested while in a state of deep muscular and mental relaxation induced by tape-recorded instructions. Before the correspondences were rated, all subjects indicated their degree of relaxation on a ten-point scale. It was found that highly relaxed subjects yielded significantly better correspondences than did less relaxed subjects. Thus, subjects listening to the same relaxation-inducing instructions actually relax in different degrees and these degrees of relaxation are in turn correlated with degree of psi performance.

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In our tenth experiment, degree of physical relaxation was measured objectively by means of electromyographic recordings from the frontalis muscle group of our subjects. Half of the subjects listened to relaxation-inducing instructions, while half listened to and followed tension-inducing instructions. Subjective physical and mental relaxation ratings were also collected. It was found that highly relaxed subjects (EMG-defined) scored significantly better than did subjects who were less relaxed. Subjects following tension-inducing instructions scored lower than subjects listening to the relaxation-inducing instructions. The subjects' subjective ratings of their own degree of mental and physical relaxation correlated positively with objectively measured muscle tension (EMG). Since we also measured the subjects' belief in psi and in their own success under the experimental conditions, their moods, attitudes, and expectancies by means of a series of scales, we were able to show that the tense and the relaxed groups did not differ significantly on those important psychological variables (mood, attitude, expectancy) and that the difference between groups in psi scores was actually due to differences in degree of relaxation.

In our eleventh experiment, we explored still another altered state of consciousness characterized by low muscular activity and by low arousal. This was an experimentally produced hypnagogic state, induced in the laboratory by means of unpatterned visual and auditory stimulation. Subjects looked into a uniform field of white light (looked at a frosted glass screen of illumination through halves of ping-pong balls attached to the eyes) while listening to loud white noise presented via headphones (visual and acoustic ganzfeld techniques). After thirty to forty minutes of such unpatterned stimulation (also, the subject is instructed to talk constantly throughout the experiment), the subject drifts into a hypnagogic state which is similar to a dream state in which subjects can give running commentaries on their "dreams." Control subjects were treated similarly, with the important exception that the hypnagogic state was not induced. All subjects attempted to gain accurate psi impressions of colored art prints being sensed concurrently by a sensorily isolated agent. Results indicated that subjects in the hypnagogic state showed significantly good psi performance (similar to that of the relaxed subjects in the experiments already reported), while subjects in normal consciousness scored at chance.

In summarizing all eleven experiments, it seems that states characterized by low muscular activity and low arousal are able to facilitate the psi process. In our next experiments, we will attempt to produce even more profound relaxation and low arousal states using biofeedback techniques and will determine how such states interact with psychological variables (mood, attitude, expectancy) to affect the subjects' psi performance on various tasks.

Psychological Factors

Throughout the experiments described above, we have been collecting information about the psychological conditions of our subjects by having them describe these conditions on ten-point scales. We already have evidence to indicate

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that (a) subjects in a "happy" mood do better (in terms of psi performance) than subjects in a "depressed" mood, (b) subjects with a positive attitude toward the experiment and the experimenter do better than subjects with a more negative attitude, (c) subjects score better on pictures they like than on pictures they do not like (even though they do not know sensorily which picture is the target at the time of sending), and (d) the agent's mood, attitude, and state at the time of the experiment is an important variable, with "positive" moods and attitudes yielding good psi performance in the subjects for those sessions.

Acquiring information about which states facilitate and which depress the psi process will ultimately allow us to study the psi process far more efficiently, make practical use of the psi process, and permit us to begin to construct theories about its nature and mechanisms. We believe our experiments provide us with the first steps toward this threefold goal.

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UNUSUAL STATES OF CONSCIOUSNESS

[Paper by Viola P. Neal, PhD, Vice President, Higher Sense Perception Research Foundation, Inc., President, Roland Neal Press, Inc., President, Biometric Research Foundation, Inc., Beverly Hills, California in English]

[Text] During my thirty years of research in the field of Parapsychology or Higher Sense Perception, unusual states of consciousness have been an area of special interest. This particular discussion has to do with these states of consciousness, either when the individual is fully conscious and wide awake or cases when the individual can repeat word for word information which he has received in the lecture halls of "Night Classes."

I. There are individuals who are able to project what is presumably a mental thoughtform of themselves, visible at unlimited distances, while they are fully awake. They may be conversing with friends at the time or otherwise occupied in their own locale. This is referred to as bi-location. It is distinctly different from astral projection. In the case of astral projection the individual is not awake and aware in his physical body as he is in these experiences of bi-location. In the cases of bi-location the individual may or may not be aware of projecting an image of himself which is clearly visible to people at near or far distant places. The instances of Padre Pio projecting such images of himself are well authenticated by very reliable witnesses.

These instances of bi-location or a projected thoughtform could be explained in a somewhat different manner. I have sometimes called it a projected mental antenna. One, among many individuals with this ability, is a man whose career I followed for many years. While he was sitting at a conference table he could mentally project himself to any area on the White Sands Installation. He could look at, and comprehend the functioning of, any of the equipment and report on it at the conference table without taking his attention from the current discussion in which he was involved at the moment. He could do this with regard to highly technical installations, buildings or offices where he had never been actually physically present. He could even do this when the equipment was not related to his department of work and did not come in his specified field. He

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could immediately contribute information so obtained to those present at the conference in which he was at the time participating. This man has a number of other very unusual gifts somewhat related to this particular one. His ability has been tested and his information found accurate.

II. There is another type of awareness in which the individual has what can best be termed an "Extension of Consciousness." There are times when an "opening up of consciousness" occurs. The individual may be able to induce these states of consciousness, or they may occur involuntarily. The individual is fully awake and aware; he is conscious of all the activities around him and can handle the normal experiences in which he is participating at the moment. He seems to experience an extended dimension of sight. He is able to see the etheric or bio-plasmic body and field of human beings, animals or plants while at the same time perceiving the physical form. A first experience of this type usually sends him to the opthalmologist to have his eyes examined and the doctor finds nothing wrong. Repeated experiences of this kind lead him to observe the phenomena more carefully. He discovers that he is experiencing an extended level of sight and consciousness and his observations become valuable and meaningful. He begins to observe differences in the vital forms of living things and the field accompanying the forms. This is particularly helpful when the individual is in the therapy field.

Sometimes this opening up of consciousness comes with a flash of understanding which solves the problem in a research or development project. Nicola Tesla had these sudden flashes of insight which accounted for many of his discoveries. There were also many occasions when he saw an invention in three-dimensional space down to the last detail clearly pictured in front of him. He was then able to build the device so that every part fitted accurately without any changes being necessary.

Such states of consciousness may give the individual who is in business a sudden flash of the total economic picture with valuable insight as to the course of action he must take. He may discover that he must take a totally different line of action than he had planned. He learns to trust these insights as he finds them working out to his best advantage.

A general in World War II related a number of outstanding incidents to the author, in which he disregarded the briefings of his best officers in making decisions. In each case, if he had made the decision which all the facts indicated to be right, the results would have been disastrous. At such times his awareness seemed to open up beyond the immediate area of all the facts and knowledge available to him. He perceived a vaster picture with elements of the situation not apparent at the time. He also owed his life to these sudden moments of extended awareness.

III. There is a type of extended consciousness which is sometimes referred to as Psychometry. From my own observations and research I conclude that there are several types of this ability. One type in particular can be very helpful to the historical novelist or to the geologist. An individual given

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a small piece of material from a historical site moves into a three-dimensional picture in sight, sound and feeling tone, of the historical event connected with the object. The individual with a gift of this type is at the same time fully aware of the room, the chair in which he is sitting, and of other people present. We might call this bi-dimensional awareness. Mrs. Denton, a psychometrist of the last century, could see the chariots and the people moving in the streets of an ancient city. She could describe the weather, the emotional state of the people, their dress and what they were doing. When she was asked to hold a stone from a mining location and describe the terrain, she gave an accurate description of the minerals underground. In each case, subsequent mining excavations revealed the minerals exactly where she had seen them. Her work was carefully documented over a period of twenty years. However, there are individuals today who have a capacity for this same bi-dimensional awareness. Less gifted psychometrists may "get impressions" regarding an object. This is a type of perception above and beyond the usual state of consciousness but not so spectacular as bi-dimensional awareness.

IV. We use the term "clairvoyance" rather loosely to cover a large area of phenomena. The individual who sees an "aura" visibly has the least valuable type of clairvoyance. What is seen usually has little significance and is interpreted differently by each clairvoyant. This kind of perception is a seeing of the astral field as if it were physically present. Even when the individual sees colors around another human being, this is still largely subjective though it may be physically visible.

There is a higher and more accurate type of clairvoyance which is rare. This type of clairvoyance can better be designated as an "unusual state of consciousness." The clairvoyant does not see a phenomena as physically existing. It appears that the individual or object being observed flashes the picture of its state and condition on the screen of the clairvoyant's mind. One would presume that such a picture always exists in time and space but that only a few people have the type of ability to receive the pictures clearly on the screen of the mind. The individual who has this type of ability to a marked degree seems to get accurate pictures of the inner and outer states of the "thing in itself." In these cases, the individual receiving the pictures may get a multi-dimensional moving picture, from the bio-plasmic level through the emotional and mental dimensions. Individuals with this type of awareness are fully conscious at the normal level while at the same time their mental screen is receiving the pictures of the person or thing on which their attention is focused. This whole process is totally different from just "getting impressions" or seeing color around the human being. With training and effort an individual with this type of gift can give very accurate information about the state of mind, emotion or health of the subject under observation.

V. There are a number of people all over the world who attend "night classes." This phenomenon is included in "Unusual States of Consciousness" because the individual does not entirely lose contact with normal consciousness, and because he can recall accurately word for word the lecture which he has attended in what appears to be "another dimension." Those who have this type of

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experience describe it very similarly. They enter what appears to be a classroom of a university and the lecturer proceeds to give a lecture which is in orderly and logical sequence, and which gives useful and valuable information. These lectures often give information which is not found in textbooks anywhere. They point out relationships not before perceived or new approaches to knowledge, or provocative information to be tested out. The individual attending these "night classes" sees students of all nationalities present. He may see the same students over and over again without knowing their names. He may see people whom he recognized in everyday life. There are times when two people in widely separated parts of the country recognize each other in a class and recall clearly each that the other was present. In such cases, each one can write down the information given in the lecture, exchange information and find that they have reported the same lecture. Sometimes, those attending the lectures do not recall the precise information given in a class, but they find themselves discovering and applying new ideas in their work or their projects with the vague idea that they "heard all this somewhere."

Those who recall these night classes clearly are aware of the procedure of attending "night classes." The person moves from waking consciousness to a state of semi-waking consciousness in which he is aware in both the sleeping and waking states at the same time. He maintains a careful balance between these two, and then moves deeper into a state of awareness wherein he clearly perceives and understands the lecture that is being given and the classroom and his classmates. He is still aware in some measure of his own room and his own familiar surroundings; this is a rather tenuous awareness. It is important to hold this tenuous awareness in order to move back into waking consciousness with the ability to clearly recall the lecture that has been given. These lectures in "night classes" do not have the quality of the usual dream state. They are clear and vidid and the situation contains no illogical elements. It is as if the normal conscious state must be dimmed out, not quite completely, in order to phase in another existing dimension which is there all the time existing on its own but not usually perceived. In contrast, the dream state appears to be a fantasy state related to the person's own subconscious. Those who have the experience of attending "night classes" seem convinced that they are not involved in any subjective state of their own, but are participating in an existing dimension separate and apart and with as much validity as the normal dimension of life in which we function. All these states of unusual consciousness, in which the individual is in conscious control of his own faculties, constitute a valuable field for more intensive research.

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EIDETIC PSYCHOLOGY

[Paper by Henry Evering, Eideticist, Center for Eidetics and Biofeedback Studies, 43 Eglinton Avenue, East, Toronto, Canada in English]

[Text] The term eidetic is derived from the Greek root eidos and has 3 aspects:

1. Eideticos = of a form

2. Eidetic = of or relating to voluntarily producible, visual images, patterns or pictures, having almost photographic accuracy

3. Eidos = form

All life interactions occur as "action-interaction-reaction behavior patterns ad infintum." They not only occur within the environment, they are also of the environment. This automatically leads to a co-occurring insidedness and an outsidedness. The whole environment being the universe as a pulsating energy continuum, occupying all space and which contains a communication exchange within its system. Scientists of all ages proved many times very opposing concepts of our universe. While Einstein proved the non-expanding universe (Finite and unbounded Space), Hubble proved the expanding universe (Infinite and unbounded Space).

Concepts of Duality

Man's limited view of a whole continuum or infinity is brought about by one great factor and that is--since there is birth, there is death. Therefore everything must have a beginning and an end. Since this is all that man can see, he assumes that everything else must be finite. Sure, there are appearances and disappearances (black and white holes) but taken from the view of a continuum-energy-point-of-view, the above-mentioned appearances are only different aspects or so-called finites of one and the same whole thing. Unfortunately, this concept led humanity to comprehensions like light and dark, animate and inanimate, life and death, etc., and finally to a dichotomy with no end. Even

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today's analysis is basically oriented towards dichotomy (or the taking apart). On the other hand, we know all too well, that when one draws a circle in a plane, all we do is create an inside from an outside. The inside being concave or finite and the outside being convex or infinite. Now we see instantly that concave and convex as well as finite and infinite are always and only co-occurring phenomena. Many other co-occurrences can be stated such as a proton and a neutron, father and mother, east and west, north and south etc. We also know, that co-existing complementaries are behaviorally interchangeable.

Interestingly, all of man's concepts in reference to inanimate and animate went by the wayside with our ability to photograph spaceship earth' with all its energy emissions. By measuring not only all crops and trees, but also the elements themselves, we may not yet realize that we are actually measuring a universal communication exchange. It is all possible, because colors contain a communication, constant, as yet unrecognized by the majority of scientists. No wonder, because we lack simply an awareness of color. Without a concept of triangulation it is impossible to deal with the three primary colors and it is also impossible to deal with forms such as a tetrahedron as well as it is impossible to deal with father, mother and child--the apex in a triangle.

Concepts of Triangulation

The Psychotronics Conference now, and many scientists of old, presented the world many times with concepts of triangulation. The ancient Pyramids and Pythagoras especially, presented the world with a very concrete and precise Science of triangulation. We cannot forget our eastern scientists who developed the I Ching system, whose 6 lines are to be taken as 2 inverted triangles. Similarly did Dr Albert Evans of Middlefield, Ohio, USA discover that when a transparent solid pyramidic object is exposed to light, it reflects a six-pointed star at its very base. A number of scientists have presented us with various terms, to acquaint us more easily with that which is involved, in order to comprehend a universal continuum. We are confronted with terms like (1) space and movement, (2) consciousness and light, (3) sound and time, all are different aspects of a cosmic whole. Pythagoras had a good point when he taught his students numbers, colors and sounds. By sound is meant the vibrations of the elements (matter) and by time is meant the slow-down of light. A closer look at the three above primary pairs will convince everyone soon, that each of the above pairs are not only co-occurring or co-existing, but also complementaries and are therefore behaviorally interchangeable. Hence again a seemingly dual concept. However, a second look at these primary pairs will make us aware that all of these aspects are simultaneous and therefore are triangulated among themselves as pairs. There is a further triangulation possible, between their secondary half-part-components. Together this presents us with a triple triad. For better understanding I tabulate the above data:

1. Space and Movement	2. Consciousness and Light	3. Sound and Time
Positive Energy	Equilibrium -- Energy	Negative Energy
⊙	▽	⊔
Passive	Active or Passive	Active
Cosmic Will +	- Empathetic Will +	- Intelligent will

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Since all aspects of all these forms are inter-related and susceptible to intercourse, energy can circulate and is in motion, and therefore no part is isolated, but is only a part of the whole. It is also obvious that the above 6 component aspects are all 3-dimensional, including consciousness and time. I would like to recall now, that it is possible to sever any space in a continuum. Enclose it with a skin or border and we have a universe that contains innately all of the above aspects of energy. (We must not lose sight that there is still an interaction of energy with the environment.) This energy seems to be functioning in a certain hierarchical order in a predictable way--see accupuncture or certain demonstrations by some Eastern Yogis, or in some spontaneous healings. Among all earth creatures, the human being above all, seems to be endowed with an awareness of all the above. His consciousness of these forces lets him feel that he is the created creature, created to perceive and to create.



In the above presentation I omitted colors as the 7th point. This point, together with the 9 points of the triple triad, leads us to the famous pathagorian number 10. Colors, as you know, are reflections of white light. They are therefore an indication if inertia at various levels. Space age brought us a lot closer to investigating colors and their possibilities.

Man's Internal Physical Environment

It stands to reason that man, having grown out of and within the above cosmic system, is innately endowed with the gift to acquire an awareness with which he can comprehend many of nature's patterns. He can successfully operate and direct certain matter by thought, will and visualisation-process. The effect of thinking or talking to a plant, the changing path of a particle in the atomic world by mere observation or the change of body-temperature and heartbeat through biofeedback training is all possible through modified will. The research by Bogen and Sperry of split-brain-subjects came as another breakthrough in modern times. As you know, they discovered that the right side of the brain is tuned in with universal comprehensions and overviews, thoughtforms, images or an eidetic comprehension (Gestalts), C. C. Creative Genius, while the left side is tuned in with the so-called concrete or tangible (I.Q.). We are now confronted with research data which proves what many philosophers have been saying throughout history. Man can perceive both the cosmic intangible (C.G.) as well as the tangible (I.Q.). The split-brain research together with biofeedback research lets us comprehend that some people are able to communicate in and operate forces other than in the concrete. This proves thereby the concreteness of the so-called inconcreteness. By now it is all too obvious that man creates all the time at intangible levels, which in turn becomes tangible in his own body wherein muscles seem to have memory. (Reichian Armor). A change here is causing changes in personality.

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Man's External Tangible Environment

The same creative process applies to all artificial creations like buildings, cloth, furniture, etc. Man imagines first and then builds or buys according to his image, plan, symbol or conception. I like to stress "to his image," because therein lies the external clue, that man can discover his own mental makeup if he would know more about the psychological meanings of environmental components, in other words "form-or eidetic perception." A change in man's external environment has the same changing effect on man's behavior as the former, since he interacts with the environment anyway.

Eidetic Psychology

Although some of the environmental patterns, as well as their components, are rather obscure, eidetic psychology postulates, that every human being is endowed with an innate ability to perceive all of them. Consider that he is present while his body builds itself within the environmental whole. LSD research shows that a memory of parental conversations are precisely stored in the subconscious. In this way he can respond creatively and spontaneously to any situation. It is a conscious awareness and use of this ability that many of us lack. Since all existence appears as one form or another, form is to be conceived of as the key to all "action-reaction patterns," (existential as well as abstract.) The keys or symbols of "eidetic perception" are the

3 Basic Lines:	1.	Rotary	2.	Vertical	3. Horizontal.
3 Basic Colors:	4.	Blue	5.	Yellow	6. Red
3 Basic Forms:	7.	Sphere	8.	Pyramid	9. Cube

Man's external and physical environment as well as his internal image-world is perceived as an infinite combination of the above nine components. The comprehension to eidetic perception is the using of the eidetic triple triad key, which provides, when understood, the basis for mastering the synthesis of existential, humanistic and cosmic philosophy. Notice the similarity of the intangible cosmic-triple-triad and the tangible eidetic triple-triad key. The eidetic key allows for a comprehension of cosmic triangulated abstracts and the 3 dimensional-dual-appearances. Innately man perceives form, color and line at various levels of consciousness. Sightless seeing, thought, imagery, memory and dream-states for instance, seem to be impossible without a concept of line, color and form. Therefore, the above three components are not only the language of the environment, they are also in an abstract sense, the silent language of man's inner image world. They serve as a kind of natural communication bridge which all men innately know, share and understand. Throughout history man tried through symbology by number, letter or color, engraved in stones, to communicate to later generations certain clues to a better comprehension of the Operant which governs psychotronic energy. Eidetic psychology includes the awareness of the following aspects of form:

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Form-Matter: tangible or intangible, lateral, symbolical, image or abstract.

Form-Motivation: function, movement and direction.

Form-Shape: as a patterned organismic whole, expressing its intrinsic force.

Form-Energy: motion, light, sound and color as a particle, wave or rhythm.

Form-Force: gravitational, electro-magnetic, nuclear and weak interaction.

Form-Field: space, movement and time.

Form-Life:	a) body, action and objective.	9, 8, 7.
	b) will, feeling and intuition.	4, 5, 6.
	c) consciousness, awareness and thought.	3, 2, 1.
	d) mind.	10.

"Eidetic perception" views the awareness of all forms in their entirety--that as of form, force and rhythmic energy fields. In this treatment of entireties and wholes, rather than parts, eidetic theory is basically similar to Gestalt Theory. For Gestalt Theory also refuses to treat man in fragments, on the contrary, it regards him in his totality as a functioning organism within the environmental whole. Since eidetic principles underlay all existence, it organizes both; what we perceive and how we perceive it. It is the form-force-energyfield that gives all life unity and wholeness. The perception of the whole or Gestalt-awareness of form and its functions in its entirety is eidetic perception. It is a form of comprehension in which form and/or the image thereof become clearer. It is a framework for conceptualization, a framework which makes conscious the intuition about forms which all men share, like the framework of numbers, sounds and colors as universal letters.

Ecological Applications of "Eidetics"

In a very extended sense this eidetic triple triad key, in conjunction with computer programming could provide a framework and basis for mapping of earth's triangulated and continuous energy processes, as well as three dimensional appearances. It can bring Global-Village concepts right into our living-room via television. The eidetic philosophy is an inclusive one that brings together the analytical qualities of various researchers and combines these with the synthesizing intuitions from other researchers and the arts. It aims towards a synthesis and welding of many principles, including biofeedback and creative training, the achievement of which will provide a very powerful tool in man's effort to improve his lot. Eidetic psychology is not a new science but one of the oldest as many ancient recordings and pyramids convey to us. I think it serves well as a theoretical basis for all psychotronic researchers.

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POSSIBILITY OF UTILIZING PSYCHOTRONICS IN CREATIVE ACTIVITY WHILE SUBSTITUTING THE INFORMATION FACTOR FOR THE FACTOR OF RANDOMNESS

[Paper by Engr Stefan Gulas, Czechoslovak Research Institute of Labor, Bratislava, Czechoslovakia, in Slovak]

[Text] The present-day psychology of creativity regards the factor of randomness as a characteristic of creative activity. It is generally established that the results of creative activity are influenced very strongly by this factor, and hence they occur randomly. The psychology of creativity considers randomness as a factor that is independent of the subjective or even the objective conditions of creative activity, and hence is an uncontrollable element that hampers considerably overall control of creative thinking, and hence of creative activity as well. In the psychology of creative activity, the existence of the factor of randomness is perhaps the greatest obstacle to the full development of man's creativity.

But the question remains whether in the psychology of creativity the existence of the factor of randomness is merely a temporary state reflecting our present cognition or noncognition of man's essence, or an unalterable state, i.e., a reflection of objective reality that will always occur randomly, inexplicably, and hence without the possibility of closer cognition and control.

The factor of randomness in creative activity is closely related to the cognition of man's essence. Any research leading toward a better understanding of man is directed toward a better understanding of his creativity. Research of creativity, then, cannot be separated from the cognition of man as a natural and social being. Because psychotronics is on the trail of certain new concepts and facts in the cognition of man's psychophysical essence, which is fundamental for his creativity, psychotronic research to explore and control creativity and creative activity is very interesting and stimulating. The present contribution outlines some interrelations of creativity and of psychotronic research that offer new possibilities also for the research of creativity.

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Informational Concept of Interpreting Randomness in Creative Activity

One approach to limiting the effect of the factor of randomness in creative activity is to replace this factor with another one that permits a better understanding of the mechanism functioning behind the screen of randomness. This new, substitute factor is the factor of information. Actually this in not merely a factor but a basic quantity that in recent years has been adopted, for example, also in physics. To the conventional basic physical quantities, i.e., to mass and energy, also information has been added as a new basic quantity, one that is of importance to every physical system. In man, such information on the one hand is the genetic code that is of importance in the formation of the given individual's soma and psyche; and on the other, the formation of his psychophysical essence is affected also by outside information that updates, influences and modifies the internal genetic information. But not all outside information depends, or such information does not always depend, on the given individual's choice and will, and hence its effect appears as random. However, by exploring the action mechanism of outside information, we are able to gradually reduce the action radius of the factor of randomness in creative activity and thus come closer to the better control of such activity.

Biological research is concerned with the exploration, selection and action of genetic information. The outside information that the creative individual receives, and which is of importance for his creativity, is the subject of research in several scientific disciplines that lately include also psychotronics. Psychotronics is concerned with the information received unconsciously, by extrasensory perception, i.e., without the subject being aware of it. Therefore the synapses -- i.e., the junctions of the brain cells containing genetic information -- may be determined not only by conscious experience and ideas, but also by unconsciously received information. Perhaps herein lies the possibility of influencing man's creativity, specifically at the expense of the factor of randomness.

The difficulty admittedly lies in the very complicated interactions between the internal and external information that influence the development of man's personality, his capabilities, actions and behavior. These interactions are so extensive that we are unable to recognize the laws governing them. Gauquelin [1], for example, found interactions between genetic information and the information of so-called cosmic clocks. He came to the conclusion that already a person's birth occurs at a moment when his genetic information is matched by certain cosmic information that is very similar to the cosmic information existing at the time when this person's parents were born. Jonas [2] came to similar conclusions concerning a person's death. Even though the effects of the various types of information and of their interactions are very extensive and complicated, the important thing is that randomness manifests itself in principle as failure to recognize the information effects. Man's ontogenesis, or even

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his phylogenesis, does not necessarily presuppose only randomness. It is difficult to accept as a result of randomness, for example, the fact that the quantity of genetic information in man has increased constantly and very rapidly during his evolution [3]. For randomness has no trend. A trend is a manifestation of conformity to some law, in our case to the law governing the effect of information.

The factor of information, which we substitute for the factor of randomness, has the advantage that it can be investigated. Also for this reason it is more expedient to operate with the factor of information than with the factor of randomness. Substitution of the factor of information for the factor of randomness provides more-specific prospects for a better understanding of the mechanism of creative activity, and thereby also for its control. Because outside information received through ESP, which is being researched by psychotronics, belongs among the least researched information influencing creative activity, the cooperation of psychotronics in the research of creative activity is highly desirable. In the research of creative activity it is regrettable that so far psychotronics has not cooperated with psychology, heuristics, and other scientific disciplines that are investigating the feasibility of controlling creative activity more effectively. Sergeyev [4] called attention to certain similarities between creative activity and psychotronic phenomena, for example, telepathy. So far as the informational nature of these similarities is concerned, from his comparisons it may be concluded that the creative process, in the same way as telepathy, involves not random phenomena but as yet unknown laws, some clues to which have already been found in psychotronic research. It appears that research of creativity lags behind psychotronics in the cognition of these laws. Hence cooperation with psychotronic research, specifically on the basis of substituting the factor of information for the factor of randomness, could advance somewhat also psychological research of creativity.

The Creative Subject's Field of Biological Information

The field of biological information is a special part of the total information field surrounding the creative subject. According to Sergeyev [5], the field of biological information is a physical field that is a source of special information of biological origin. The specific receptors for the reception of this information, and the medium through which it is transmitted are still unknown. Therefore the reception of such information is called ESP.

The fact that information is involved means that information reduces the indeterminacy of the system, or that the system can be controlled on the basis of information, and will behave and react accordingly. The signals that carry this information are human thoughts, imagery, sensations, and other products of the human psyche. The subject receives this outside information unconsciously, and it influences him without his being aware

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of this. We may assume that the subject receives such information into his subconscious and superconscious. Here we assume that the subconscious, as one of the three psychoanalytical levels of personality, contains not only the inherited and congenital instincts but also the consequences of our actions, as well as the mentioned biological information received through ESP.

In creative activity the category of the subconscious is important because it is generally believed to be the region in which intuition arises. Although it is generally recognized as the nucleus of creative thinking [6], we know very little about intuition. In the psychology of creativity, the mechanism of intuition is still a big question mark.

The effect of the entire information field upon a creative subject, including the field of biological information that the subject perceives unconsciously, is presented schematically in Fig. 1.

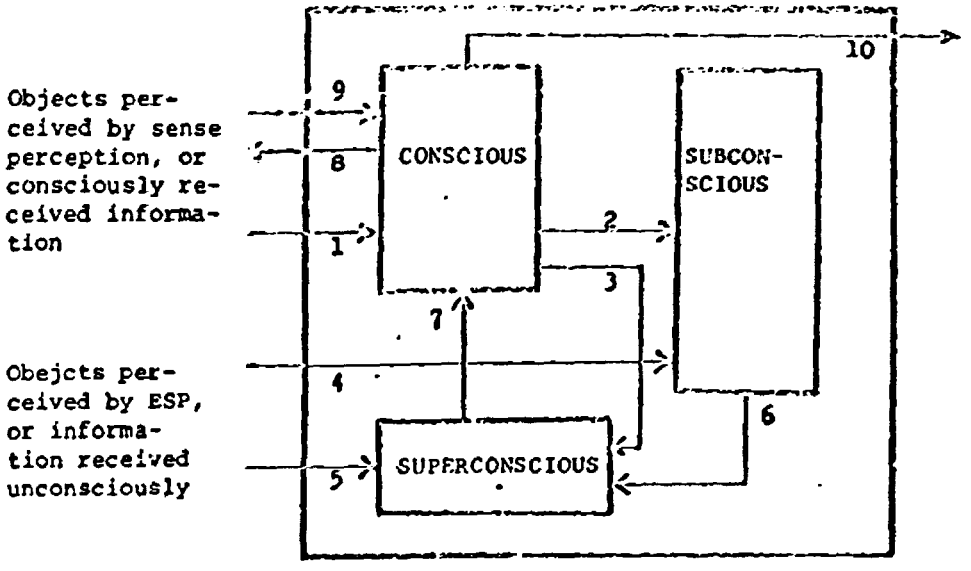


Figure 1. Effect of outside information upon the levels of the creative individual's personality, and the interactions of these levels in the process of creative thinking.

Key:

1. Definition of the problem by study;
2. Storage of consciously received information in the subconscious;
3. Storage of consciously received information in the superconscious;

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4. Storage of unconsciously received information in the subconscious;
5. Storage of unconsciously received information in the superconscious;
6. Before a creative intuitive idea enters the conscious, it passes through the filter of the subconscious;
7. The filtered intuitive idea enters the conscious for logical verification;
8, 9. Interactions during the verification of the creative intuitive idea with the real problem, the object;
10. The verified creative intuitive idea as the final product of inventive creative activity.

The area that the field of biological information influences the most is the subconscious, i.e., that level of the creative subject's personality in which the as yet little known processes of intuitive thinking take place. Perhaps because they are so little known, these processes are strongly characterized by the factor of randomness. However, psychotronic research of the field of biological information could explain also certain phenomena and mechanisms of intuitive thinking, whereby the effect of the presently very strong factor of randomness in creative thinking could be weakened.

Substitution of Unconscious Information for the Lacking Conscious Information

It is very likely that in the process of creative thinking the subject compensates for some of the lacking conscious information with subconscious information, and also with information received unconsciously from the field of biological information. This hypothesis is based on the very definition of intuition as the ability to understand the whole before all its parts are known [7], or in other words, before all the information about the whole is available. Because situations in which information is lacking are becoming more and more typical of creative activity, the question of substituting unconscious information for the lacking conscious information is very timely. The substitution of unconscious information for the lacking conscious information involves a risk of error, but such a risk is associated, for example, with the modeling of any system. This risk, then, cannot be excluded from creative activity. On the other hand, however, we strive to accelerate the solution of situations in which conscious information is lacking, specifically through a better understanding, utilization and control of the subconscious and of the field of biological information.

The substitution of subconscious information, and of information gained from the field of biological information, for the lacking conscious information truly seems to be one of the basic conditions for creative intuition. Cognition of this process of information substitution is therefore of exceptional importance to creative activity. If we wish to

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analyze this process of substitution, we can rely on certain similarities between creativity and psychotronic phenomena. One of the conditions common to creativity and, say, telepathy is creative quiet, a state of actual creative or telepathic preparation. Drbal and Rejdak [8] report that the so-called creative period is similar by nature to the state in which test subjects find themselves during their telegnostic manifestations. In practice this state cannot be attained at any time, due probably to the surplus, shortage or excessive standardization of the consciously perceived information, and probably for the same reason also in the case of information received unconsciously. For the brain does not receive information with sufficient intensity when there is too much information or when the flow of informatic . is reduced. We may conclude this also from the fact that, for example, an excess of rational information in science and technology can arrest our ability and sensitivity to receive information arriving from our own experiences, sensations and emotions [9]. An ordinary quantity, and perhaps the individually optimal quantity, of information appears to be one of the favorable conditions for the occurrence of telepathic, telegnostic or other psychotronic phenomena, and also for creative activity.

Regarding the quantity of consciously perceived information, Sergeyev [10] reports that most traffic accidents occur under either very simple or very complex conditions, i.e., when there is an overabundance or shortage of consciously perceived information. So far as unconsciously perceived information is concerned, Sergeyev [11] also reports that experimental parapsychology ofterd demonstrates a relationship between the phases of the moon and the fluctuations of the gravitational field, on the one hand, and the effect of these changes on parapsychological phenomena, on the other. The conditions for the unconscious reception and selection of biological information may be influenced by the activity of the creative subject's ego, but they may be influenced also by magnetic and cosmic effects. Under certain magnetic and cosmic effects, then, control of the reception and selection of biological information in a creative subject may be more or less optimal, and this in its turn may affect his creativity and intuition. In this direction, then, new horizons are appearing for the research of psychotronic phenomena and for the research of creativity.

The outlined possibilities of utilizing certain results of psychotronic research may be regarded as promising also in research of creative activity, and therefore it is desirable that psychotronics establish cooperation as soon as possible with the scientific disciplines that are concerned with the research of creativity.

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RELATIONSHIP OF PSYCHOTRONICS TO CREATIVITY

[Paper by Dr Engr Antonin Duron, Prague, Czechoslovakia, in Czech]

[Text] In practically every field of human activity, the demands on creative work are rising. Experimental methods are being sought to develop man's creative abilities, to explore the structure of the creative process, to measure the degree of its development, and to determine whether some relationship exists between creative activity on the one hand, and intelligence and its components on the other.

Creativity is becoming a separate subject of scientific investigation. According to Sergeyev, creativity can be compared to psychotronic phenomena. Therefore, some of the knowledge about these phenomena can be used to explore creativity itself. Our task will be to briefly review the basic factors of creativity, their measurement, and the present methods. But we shall focus our attention primarily on the relationship of psychotronics to this knowledge.

What has the measurement of the basic factors of creativity produced?

In present practice there are essentially two approaches. One seeks out the people who generally can be termed creative, and studies their personality structure. Whom to designate as creative still remains a matter of conjecture. This cannot tell us much about the essence of creativity. The other approach analyzes the nature of creativity, and its components. Guilford regards creative activity as the product of various factors. His renowned model of the intellect lists an entire series of factors that pertain to creativity, and they are grouped into four basic components:

1. Fluency that combines the factors of quick thinking, for example: word fluency, the ability to express oneself, and the ability to present on each problem as many ideas as possible, without regard for the consequences and practicality (brainstorming).

2. Flexibility, i.e., the ability to seek new ways of expression, or to use different types of strategies in the solution of the given problems;

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3. Originality means giving unusual answers, or the ability to form distant and indirect associations, to answer adroitly and cleverly.

4. Elaboration, which is actually the resultant combination of the mentioned factors.

According to Guilford, creativity is an intellectual performance, the same as any other. The more creative a person is in his work, the more frank he is emotionally, and the better he is able to understand himself. The range of his interests is broader. An important role is played here by the individual's sensitivity, to which both psychotronics and the psychology of creativity attach great importance.

On the basis of present knowledge, what are the distinguishing features of creative activity?

First of all, an effort to solve a known, or perhaps a new, problem by novel means (operations and information). The resulting creative work is regarded subjectively as something new, unique and nonreproducible. Objectively it is always new, and also always unique and nonreproducible.

The process of creativity, just as certain processes in psychotronics, is accompanied initially by an urge, a creative intention, oppressiveness and tension. Toward the end there appears relaxation. These psychic states are separated by idea, enlightment, and insight. The result shows a progressive trend, in terms of the changes in psychic organization, and also in terms of the suitability of its relations to the environment.

To supplement the preceding, we will mention briefly some of the more significant theories on the process of creative thinking.

Noteworthy is the so-called theory of brain waves (encephalography). According to the German neurologist Berger, the most pronounced among the brain waves are the alpha waves (they have a pulse frequency of 10 per second). The rhythm of these waves originates in the cerebral cortex and increases with the subject's mental age. The alpha waves have their characteristic structures corresponding to certain psychophysical states, and their patterns correspond to various types of thinking. Also psychotronics is devoting close attention to alpha waves.

The Colombian psychologist H. Ruger has verified that problems often are solved suddenly when we analyze superficially that part of the problem which is causing difficulty, when we apply to it our experience in a similar situation that we have already solved. This requires a positive approach to the problem and suitable concentration.

Claparede based his theory of new ideas on so-called resonance. The nature of the problem evokes in our past experience some kind of resonance, i.e., new elements that can be useful in a new situation.

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Many other authors agree on the known fact that original ideas present themselves after intensified work on some problem. During rest following work, a sudden inspiration may occur. A study of several hundred inventors showed that they got their best ideas unconsciously, before falling asleep, in a state of relaxation, or after a night's sleep. Test subjects in psychotronic experiments fall into a state which we could characterize as a transitional form between sleep and wakefulness.

Psychotronics as a science is beginning to irresistibly penetrate also scientific disciplines that have been and still are barred to it. Psychotronic research is extending into the area of physics by studying the interactions between man and inorganic substances. It is formulating its interdisciplinary standpoint on integral anthropology. It is studying the question of interaction between man and living nature. This research is omitting neither the question of accelerating the cognitive process, nor the problem of man's creative activity.

In an effort to approximate the essence of the creative process, psychotronics is calling attention to three principal aspects of its research in conjunction with the study of creativity. These are:

1. The unconscious as an enormous potential of psychic powers that are in interaction with man's creative ability.

2. Intuition that to a certain extent psychotronics regards as the telegnostic ability of the human brain.

3. Methods based on the state of intensive concentration (conterplation) as a state that is conducive to creative thinking.

In conclusion we wish to round out these propositions with a listing of the creative person's characteristics or traits, from a study by the Slovak researcher Engr S. Gulas, entitled "The Creative Subject, His Personality, Traits and Abilities." We encounter all these traits when analyzing test subjects for psychotronic experiments, and the development of these traits is just as important to them as to creative individuals.

1. A basic prerequisite for the continuous development of creativity is a better understanding of the nature of man's essence.

2. Creativity is determined genetically. Therefore it is necessary to form the external conditions for its development, conditions that update the individual's internal potential disposition.

3. Originality and independence are the dominant traits of the creative individual.

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4. Intuition is the nucleus of creative thinking. Its occasional inaccuracy can be tolerated.

5. The creative individual possesses the ability to substitute unconscious information for a proportion of the lacking conscious information. Thus, the creative individual should purposefully train himself to creatively overcome situations in which conscious information is lacking.

6. The creative individual's role converges with his personality. For this reason he should be allowed a certain freedom in choosing his job, tasks, leisure time, and in terms of his behavior within the work environment.

7. To demonstrate his abilities, the creative individual must be assigned tasks with which he is not yet familiar, and also tasks that require more-demanding preparation.

8. Intuitive thinking is highly developed in the creative individual. Which means that more attention must be devoted to enriching his emotional life, which supports the immediate and analogical grasping of problems.

9. Professional intuition can be attained only on the basis of suitable professional knowledge.

10. Harmonious development of the mind enhances the fluency of creative thinking. Consequently, the creative individual must care for the maintenance of his mental health.

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PSYCHOTRONICS REVEALS NEW POSSIBILITIES FOR CYBERNETICS

[Paper by Zdenek Rejdak, PhD, Czechoslovak Scientific and Technical Society, Section for Psychotronic Research, Prague, Czechoslovakia, in Czech]

[Text] A huge volume of data has been compiled on the brain's memory capacity. Current experiments employing LSD lead us to the conclusion that all our activities and experiences, whether perceived intensively or less intensively, are stored. But the functioning of the brain is interesting from another viewpoint: what quantity of information can the brain process per unit of time, what is the bit capacity of the brain system, how does this manifest itself at the level of the conscious and of the unconscious, and how could we make the process of cognition more economical by studying such information.

Psychologists and psychiatrists often are confronted with the problem that their patient begins to "misuse the bit capacity" of his brain. The reading speed of Jacques Bergier, a Frenchman, was tested, and it was established that he read 10 to 20 times faster than the average reader: two million printed characters per hour, in contrast with 150,000 to 200,000 characters for the average reader. And this was only his average. He was able to read even four million characters per hour, one-third of the Bible. We might ask whether this is an exceptional talent, or is it an ability that could be acquired even by a larger sample of people, through systematic training?

Psychiatrists have frequently studied idiots savant, mentally deficient individuals with a highly specialized talent in rapid calculation. At the age of 10, for example, the feeble-minded American Truman Henry Stafford was asked to multiply mentally 365,365,365,365,365,365 by 365,365,365,365,365,365. He walked about in the room, tore his pants, bit his hand, rolled his eyes, laughed, talked, seemed absent minded, but in less than a minute he came up with the correct answer: 133,491,850,208,566,925,016,658,299,941,583,225.

Professor Dr W. Horowitze has been studying for years the abilities of imbecile twins, Charles and George, at the State Psychiatric Institute,

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in New York. When asked, for example, when would 20 March fall again on a Sunday, within four seconds they replied: "In 1977, 1983, 1988, ..." And yet they are unable to solve even simple problems of addition, subtraction or multiplication. When asked to explain their amazing performances, they reply: "We have that in our head." In addition, they are gifted with eidetic ability and a photographic memory. They remember what the weather was like on a certain day many years ago, in the morning, at noon or in the evening; at what time any nurse came on and went off duty that day; and which of the nurses had a cold. Is the brain at all capable of such "cybernetic operations"?

Let us imagine the neuron with its intricate structure as an integrated modular element that contains, besides a resistor and capacitor, 1000 transistors or, say, 1000 semiconductor diodes. The brain then has a working army of 1000 times seven billion = seven trillion semiconductor elements in operation, and another seven trillion in reserve.

If we investigate the functioning of the brain from the viewpoint of information capacity, then we find the following: The brain has about 14 billion nerve cells. If only 10 billion are able to receive information at any one time, and the transmission capacity of a nerve fiber is 14 bits per second, then this means that the brain is able to receive 140 billion bits of information per second. Thus the memory capacity of the brain seems to be a million times greater than the computer memory that stores information.

For ordinary perception and deliberation, 14 to 16 bits/second are adequate. But for more-complicated perception and deliberation, such as the solution of a mathematical problem, etc., we need about 20 bits per second. Why is there such a great reserve of 140,000,000,000 - 20 bits per second? Does this not indicate that unconsciously, subliminally, we are perceiving far more information than what has been assumed previously?

Do not the experiments with known and good telegnostics confirm this? We must assume that they, too, process and evaluate a huge quantity of information within an unimaginably short time.

In May 1956, Mrs Jean Dixon predicted: "A young, blue-eyed, brown-haired President will be elected, and he will die a tragic death." We do not even realize how much information Mrs Dixon's brain had to process within a short time, to come up with this prediction. Yet she is not a professional politician and is not even interested in politics. All this occurred at the level of the unconscious. Surpose we had asked the same question at that time (in 1956) of an outstanding political analyst who was familiar with all the trends in politics and was able to foresee the future, since good politicians generally have this ability. Assume further that his answer, his final appraisal, agreed with

Mrs Dixon's prediction. Probably our hypothetical political analyst would have formed consciously the following premises (and each premise would have been the result of extensive analysis requiring much time and the processing of much meaningful information): "Under the Eisenhower administration, the Republican Party will lose its prestige, and this will increase the Democratic Party's chances of victory. In the Democratic Party there is practically only one suitable candidate who is certain to win against Nixon. He is J. F. Kennedy. And because Kennedy is too strong a personality to expect that he might easily abandon his principles and plans, sooner or later he will necessarily come into conflict with the interests of, say, the monopolies and other forces striving for manipulation. It will be difficult to check Kennedy by legal means, and the possibility is not excluded that he might die a tragic death."

The conclusion is the same: "A young President will die a tragic death."

We could proceed in the same manner in conjunction with a prediction by G. Croiset. Mrs E., and Enschede resident, consulted him in 1938: "Would it be better if I visit my daughter in the Dutch Indies and live with her?" Croiset replied: "If you remain in the Netherlands, you will be caught in the turmoil of war. Should the war last longer than two years, it would be better for you to be with your daughter. Although war will eventually break out also there, it will not last as long as in Europe. But it is certain that after the war we no longer will have the Dutch Indies. It will unquestionably be better for you to spend this transitional period there."

In less than a minute, an excellent assessment of how the international situation would develop. We could again substitute our hypothetical political analyst for Croiset.

The difference between our polytical analyst and the telegnostics would be the same: In incommensurately much less time than he, they process about the same quantity of information. And this fact is what interests us primarily in our investigations. It leads to the conclusion that we should study intensively the cognitive processes of telegnostics and the conditions of these processes, and should attempt to duplicate these conditions for a large proportion of the population. G. Croiset's statement directly challenges us to do this: "I am a completely normal, ordinary individual. Certainly every person has the same gift as I do, but in me it is more developed. I do not possess any special, supernatural power. Regardless of who he is and where he lives, every living person has this same ability, but it is developed to a different degree. Anyone can be in contact with another person, without actually being aware of it. I have the ability to internally communicate with others, at the specified proper time, and to establish contact with them. But actually I am not different from anyone else."

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In this context it is worth noting that many world-famous scientists repeatedly admitted that their discovery simply occurred to them, and often in conflict with the logic of their purposeful, lengthy and painstaking scientific procedures. Planck introduced his constant at the age of 23 and did not understand it. Later he had to convince himself that his constant was correct.

Cyberneticians say that man at present is "the most perfect cybernetic machine," in terms of his capacity to receive, store, process and evaluate information. In practice this means the following: Suitable techniques must be developed that will enable us to utilize for conscious activity the maximum of the brain's latent capacity, or to consciously and purposefully combine at the right time our conscious activity with unconscious activity, somewhat in the same way as additional high-capacity power plants are connected to the power network during periods of peak load. Our very awareness of these possibilities is the first step toward their utilization. Important is the appreciation of the knowledge that conscious activity must be seen in its interaction with unconscious processes, that unconscious processes also participate in our cognition, and that reception of information is the most intensive specifically at the level of the unconscious. Thus, we perceive reality at the level of the conscious as well as of the unconscious. This must necessarily lead us to the study of practices that could become a bridge connecting the conscious and the unconscious. Test subjects are aware of this connecting bridge at the moment when they suddenly "know" and predict. They speak of some subdued state that is neither sleep nor wakefulness. Mrs Sinclair said: "When you succeed, you will have to exert some effort not to fall asleep. However, you must distinguish between sleep and the state you wish to achieve. There is some danger that you will fall asleep, but you must not allow this to happen. With practice and training, after some time you will be able to achieve this state without any difficulty." Therefore we must investigate the various methods of autogenic training, relaxation, contemplation, etc. These are the states that most probably are necessary for intuition, and nobody doubts the role of intuition in scientific cognition. But we must learn intuitive cognition, the use of intuition must become one of the forms of scientific solution and cognition, because it accelerates this process. Training in intuitive cognition must become as obvious in the future as training in routine scientific methods such as, for example, statistics, etc. The more so because the volume of information on reality will grow parallel with the expansion of our cognition. The mere processing and classification of individual data is a great problem already now, and the situation will worsen in the future. Even though the use of computers with large-capacity memories offers itself as a solution, it is still man who creatively builds the computers and programs them.

Theoretical cyberneticians are proposing at present the construction of computers that would "create" and would posses at least a degree of

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intuition. However, we believe that these suggestions are somewhat premature, because we have not yet mastered these processes in man and are unable to describe them adequately. Psychotronics has a great opportunity to provide much essential knowledge about these processes, and thereby to help cybernetics in solving one of the most complicated tasks, that of teaching computers to create. We can investigate the synapses in animals, perform neurotomies, and arrive at new suggestions. But these will be suggestions on the same plane as before, one that will probably prove sterile for the higher objectives of cybernetics. The point is not merely to build more-perfect computers, but primarily computers with qualitatively new functions. Work is now underway on a fourth generation of computers, and a fifth generation is being planned. Therefore it is very timely for cybernetics to include in its studies also the results of work and research in psychotronics. This will not be easy, because psychotronics has its own specifics, and these could easily be passed over in superficial applications. Yet we believe that psychotronics is able already now to offer cybernetics fruitful models.

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ONE THOUSAND SPONTANEOUS PSYCHOTRONIC CASES IN ESTONIA

[Paper by I. Soomare, Vil'yandi, Estonian SSR, in Russian]

[Text] The aims of this paper are the following:

1. To shed light on the range of psychotronic phenomena in everyday life;

2. To investigate psychotronic phenomena which cannot be reproduced by experiment;

3. To establish the objective and subjective conditions favoring the occurrence of such phenomena.

According to the data in the literature, more than 15,000 cases have so far been analyzed in the world. As we know, indicators of the intensity of various psychotronic phenomena and the connections between them and the paracharacteristics of the subjects involved have been little studied. An attempt to analyze these factors is also made in this paper.

The factual basis for this study consists of 1,000 spontaneous psychotronic cases collected over the last 8 years in Estonia. These data were by and large obtained after reports in the press and over radio and television. About 400 letters have been received, and they have been classified into the following subgroups: prediction (45 percent of all cases), telepathy (35 percent), etc.

Thirteen of all the cases were mixed. (Usually this is a combination of telepathic phenomena with other phenomena.) Cases with a high statistical weight were chosen for detailed study. These were predictions and telepathic cases.

Telepathy

1. Thirty-seven percent of the subjects who described their experiences had higher education.

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2. Forty percent of all the cases of telepathy occurred at night (from 0000 hours to 0700 hours).

3. Telepathy occurs most frequently in January, and least frequently in December (26 and 13 cases, respectively).

4. By comparison with other decades, the highest rise in the number of cases occurred in the years 1941-1950 (more than double).

5. Sixty percent of the inductors were male and 40 percent female. Female percipients made up 76 percent of the total. Cases of telepathic communication from man to animals and in the opposite direction were also observed.

6. The average inductor was 9 years older than the average percipient (30 and 39 years, respectively).

7. The optimum age for telepathic perception of information is between 21 and 25 years.

8. The forms of telepathy were the following:

a) symbolic telepathy (with breakdown into waking and sleeping states)--12 percent,

b) direct telepathy (with breakdown into six subgroups with respect to intensity)--60 percent,

c) telepathic sounds--12 percent,

d) mental image--8 percent,

e) and other cases each amounting to less than 5 percent--cases with animals and so on.

9. Fifty-six percent of the cases of telepathy were observed in the waking state and 43 percent in the sleeping state. The sleepers woke up at this point in 80 percent of the cases.

10. With respect to emotional content, the telepathic messages break down as follows:

Unpleasant (but not related to death)	30%
Death	44%
Neutral	11%
Pleasant	15%

11. With respect to the percipient the inductor is by and large an acquaintance, spouse, lover, or mother.

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Prediction of Events

1. The subjects were women four times more frequently than men.

2. The subjects had higher education in 41 percent of the cases.

3. The maximum number of cases were observed in August, and the minimum in July (35 and 15 cases, respectively).

4. The optimum age of the subject, as in the case of telepathy, was 21-25 years. The second highest peak was observed between age 56 and age 60.

5. The largest number of predictions concerned the years 1941, 1944, and 1953.

6. With respect to form the predictions broke down as follows:

a) direct (broken down into four subgroups with respect to intensity)--45 percent,

b) symbolic--44 percent,

c) sound signals predicting death--6 percent,

d) cases with animals and other types of cases, each--1 percent.

7. Seventy percent of the predictions occurred in a dream (one subject in four woke up).

9. With respect to content the predictions pertained by and large to an egocentric event. To a lesser degree the predictions concerned only the subjects himself and also acquaintances, children, spouse, etc.

10. It is a most interesting problem to investigate the time when the predicted event took place. The time required for fulfillment ranged from a few seconds to 70 years.

In cases of direct prediction the time required for occurrence of the event was usually a matter of hours, and in cases of symbolic prediction a matter of weeks. There was a correspondence between the time of fulfillment and the symbols (of which there were only 10): the longest time was related to symbolic animals and objects, and the shortest was for the symbols of deceased persons, parts of the body, and colors. But the number of symbolic cases was insufficient for definite conclusions.

11. The predictions were more frequently symbolic among women (53 percent) than among men (38 percent).

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The Personality of the Paragnostic

Brunettes with gray-blue eyes were dominant. The most frequent occupations were teacher, medical personnel, engineering, technical, and economic workers, artists, and scientists (under 10 percent).

The Periodicity of Psychotronic Phenomena

Up until World War II there was a 3-year rhythm in the incidence of the cases of telepathy and prediction taken together (1918, 1921, 1924, ..., 1939).

We should note that there is a correlation between the phases of the moon and the number of cases of spontaneous telepathy.

1. The 96 cases whose date of occurrence was precisely recorded break down as follows with respect to the phases of the moon:

a) new moon--29 cases,

b) first quarter--27 cases,

c) half moon--17 cases,

d) third quarter--23 cases,

(the difference is statistically reliable).

2. If we assume that the moon has a synodic cycle of 30 days, then the distribution of the cases by days is as follows:

1) New moon	0 no moon	3 cases
	1st day	4 "
	2d "	3 "
	3d "	7 "
	4th "	1 case
	5th "	1 "
	6th "	4 cases
	7th "	5 "
2) First quarter	8th "	4 "
	9th "	2 "
	10th "	4 "
	11th "	4 "
	12th "	3 "
	13th "	1 case
	14th "	6 cases

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3) Half moon	15th day	2 cases
	16th "	0 "
	17th "	1 case
	18th "	4 cases
	19th "	2 "
	20th "	3 "
	21st "	6 "
4) Third quarter	22d "	3 "
	23d "	7 "
	24th "	5 "
	25th "	7 "
	26th "	0 "
	27th "	2 "
	28th "	0 "
	29th "	2 "
Total		96 cases

It is evident from the table that the highest number of cases was recorded 1 day before the change in the phase of the moon and the lowest 1 day after that change (except for the third quarter).

Statistically reliable conclusions cannot be drawn because the number of observations is insufficient.

No distinct correlation was noted between the phase of the moon and predictions.

The results obtained can be used in planning psychotronic experiments.

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ENVIRONMENT AND PARANORMAL PHENOMENA

[Paper by Carlos Mora-Vangeas, Technical University of State, Santiago, Chile in English]

[Text]

I - Hypothesis and Directrixes

"Psi phenomena occur more frequently in some geographical regions than others."

I think that some of the laws or principles affecting this probable phenomena of uneveness of paranormal levels among the different geographic zones, with its consequent physical planetarium effects [on all the human race], would fall into the following basic categories:

a. Physics and Astrophysics:

A higher activity of cosmic and earthly radiation on some points of the earth would influence some human organs, increasing or diminishing the subject's paranormal capacity. It establishes a close relationship between the concepts of organic matter and inert matter.

b. Anthropology and Sociology:

Race types, in connection with anatomical and physiological characteristics that relate directly to the environment: cultural values adquiered by means of evolution [customs, i.e. religious-magic].

c. Geography and Ecology:

Latitudes, locations, climate, urbanism, pollution, and a balance of biological cycles; any delivered change made by humans in biosphera and its consequences on man.

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II - Information sources as tools for research:

Universities, Private Research on parapsychology Institutes or Centers, Ecological Research Centers, thesis and papers, Parapsychological, Sociological, Anthropological, Physical, Astronomical, etc. Institutions or learned societies.

III - Field Research

a. Statistical graphics of paranormal phenomena registered in different countries.

b. Study of the characteristics of each kind of phenomena in each geographical region.

c. Study of the anthropological and social patterns in the field.

d. Anatomical, physiological and physical studies of ESP subjects, in each geographical region.

IV - Methodology

General evaluation of a geographic region covering its human, biological, physical and geographical aspects by means of the following criteria:

1. Sampling of probabilities, if and when the phenocena are numerous within the region based in the greatest possible collection of unusual data.

2. Control and analysis of orogenical, seismic, climatological, hydrographical, oceanographical processes; cosmic radiation and constant survey of changes in biological patterns.

3. Statistic or analytic study of the relations between samples and controls.

V - Data processing and computations by subject, zone and in general [sequential or simultaneous].

VI - Analysis, results and theory formulations.

Application:

Very few researchers have indirectly used our hypothesis till now. Nonetheless some of them have preliminary results, considering only the ethnological and sociocultural variables. We mention here the studies on Cuna-Indians done by Dr Robert van de Castle in the Blas Islands of Panama, and following lines already given years ago by the Rose studies in Australia, also Gordon Wasson, Roger Heim and Straser-Pean, have studied (as does more recently Ari Kiev) the "curanderisme" (folk-healing) in Mexico, and other centre-american republics.

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Their practices are based on a religious indian root very likely to be identified in their fungian-magic meals and ceremonies. This is the specific case of famous healer Maria Sabina de Huantla de Jimenez.

On a different point of view we could mention the studies in India and other countries, examples of reincarnation, done by Ian Stevenson and coworkers, etc.

If I may resume my own experiences based in a global analysis of the most frequent phenomena in Central America, Mexico (some areas only), and some South-American countries (Brasil, Peru, Argentina and Chile). Due to space limitation I shall concrete myself to Central America and particularly to Nicaragua. This country is geographically divided in different zones agrupated in departments in which the parapsychological phenomena are almost variated. Most significant is the fact that also their traditions, habits, geographical conditions, ethnological characteristics, temperature, etc., are also very different.

In the Western Zone the most frequent phenomena are: haunted houses, raps, poltergeists (very frequent), because it is a volcanic earth surrounded by many mountains, high temperatures and permanent rains. This condition certainly activates the normal magnetic fields of this region. On the other side, the spiritistic practices are a consequence of the Indian-Spanish traditional roots which still believe in the survival idea. In a probalilistic study we did 15 years ago, I could confirm that the sample was significant in the items mentioned above, and in the 60 cases studied, 80 percent of them had almost the same features: falling stones, raps, PRSK, and most curious of all: perhaps all of them were spiritists.

In the Eastern Zone on the contrary, we have more "curanderismo" and black magic practices. Geographical characteristics are again different as also sociological and ethnological particulars.

In the Atlantic Zone of the same country, we have a special kind of faith similar to Haitian vodoo, which goes parallel with the practice of "curanderismo." This again points to differences in sociocultural, climatological and ethnical traits (a 75 percent of Negroes).

A more exhaustive inspection of our hypothesis would probably allow as in a next future an answer as to why in countries like Brasil we have more healing ("curanderismo" and spiritism, in Mexico hallucinogenic mushrooms and "curanderismo", in Chile (my actual country of residence) we have in some regions as telepathy in an island like Chiloe, and the spiritistic practice in the Central Zone.

Do you have an answer to this parapsychological question?

I hope this brief line stimulates some parapsychologists so that this theoretical frame has a support in realistic factors which may give us all an answer in a near future about the origin of paranormal phenomena.

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CONTRIBUTIONS TO A METHOD AND A TECHNIQUE FOR THE DEVELOPMENT OF EXTRASENSORY PERCEPTION

[Paper by Ceronimo Reus-Ponce, Buenos Aires, Argentina, in English]

[Text] During all my life, one of my main interests has been to penetrate into the unknown world of the nonconscious. During my youth I was involved with Indian and Chinese philosophical systems and disciplines. Afterward, Freud and Jung's ideas oriented my studies in a definite direction. To the metapsychists, commanded by Richet, I owe the impulse that made my interest grow toward the scientific study of paranormal phenomena. This interest was definitively secured by Rhine's investigations.

Nevertheless, this new interest did not stop my prior methodological orientation, developed--during many years--for the study of ESP. That orientation consisted in obtaining my own ESP capacity in order to study it, and also to develop a technique which would make possible the acquisition of ESP by other experimenters who, in turn, would be able to do their own investigation on it. In this way, parapsychology would attain the same level as other scientific disciplines. Besides, a more precise study of the laws of the subjectivity would thus be possible.

I succeeded in my effort, and I developed a method and a theory, which originated the technique that I am going to introduce to this Congress. After being perfected for application to groups, it was experimented with in some private psychology institutions. There exist positive results that support the efficiency of our technique. However, it is still at an experimental stage, and we are expecting a more thorough and systematic confirmation through highly respected and reputable scientific institutions.

0. General Considerations

0.1. The purpose of our search has been to provide a method and a technique to be used by experimenters and investigators in order to develop their own extrasensory perception (ESP).

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0.2. Our technique is operative, i.e., based on norms, rules, and procedures which, when properly followed, make it possible to attain the desired results. The theory and founding of our technique is posterior to it and does not imply any agreement to such theory. The operative technique operates independently and even despite the theory developed by us.

0.3. The techniques, experiences, and means used are purely psychological. The experimenter becomes the object of his own experimentation. He makes use of his own psyche, and thus without the help of parapsychologically "gifted" subjects.

0.4. Being psychological, our technique is subjective and individual, which is not a handicap. For, being subjective, its process, as well as its results, can be controlled and verified. And, furthermore, being individual, the resulting capacity may be transferred and reproduced.

0.5. According to our opinion, it is necessary for everyone investigating the psyche (psychologists, psychiatrists, therapeutists, etc.) to master the means for attaining ESP. This will allow him to have a more direct comprehension of the etiology of his patient's disturbances as well as of their psychological reality. In this way, he will have metagnomic means at his disposal, which will render possible a better understanding of each subject's psyche.

0.6. We assume that PSI factor is latent in every human being, but with different degrees. For that reason, we use a test for making a previous selection for determining the existence of the necessary aptitude degree. The whole process result will be the attaining of a voluntary ESP, commanded and directed like in the case of an instrument.

0.7. We are maybe too optimistic with regard to the immediate results obtained in our group research work. Of course, we are prepared to face the usual difficulties and reactions; but we are firmly convinced of being on the right path, which maybe others will travel with more success.

0.8. The technique we introduce to this Congress is still in an experimental stage. We have designed and carried out practices and exercises for implementing our technique. However, thus far they have not been sufficiently numerous and systematic as to allow the elaboration of an adequate casuistry. Circumstances have not made it possible, but we are sure that this technique is practicable with positive results and is even perfectible. We are very happy to submit for the Congress' consideration what we assume as a contribution for the subjugation and control of the extrasensory perception.

1. Method

1.1. The method we use for the training and development of ESP is psychological, individual, subjective, introspective, and contemplative.

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1.2. It is psychological because the material and the means we use dwell in the subject's psyche.

1.3. It is individual because, even when carried out on a group basis, the technique is individual-centered.

1.4. It is subjective because it is applied by the subject himself, who becomes his own experimentation object.

1.5. It is introspective because the operation is centripetal.

1.6. It is contemplative because it is neither rational, nor analytical, nor intuitive. We might say that it is like a child's attitude when looking at the moonlight glimmer on calm waters.

2. Technique

2.1. Our technique is based on a self-conscious introspection (more precisely: "introvision") and a nonconscious elaboration of mind contents (nonconscious components).

2.2. It is well known that ESP arises from the nonconscious of human psyche and that its manifestations are very elusive.

2.3. We can affirm that nonconscious mechanisms may be studied by the investigator when he devotes himself to work on his own psyche.

2.4. We are also in condition to assert that the nonconscious processes may be the object of an elaboration commanded by the experimenter himself from his conscious area.

2.5. For our purpose, we use several subjective means, which are within the reach of the experimenter, namely:

a. Attention: by which we intend the manifestation of the self-conscious Ego's energy.

b. Introvision: which means for us the capacity of directing the attention toward the psychical happening.

c. Flowing: by which we intend the act of setting free our inner events by just letting them happen, without any interference.

d. Contemplation: which means the apprehension of the contents (nonconscious components) of our own psychical happening. During this operation we neither analyze nor rationalize. We just contemplate and let it happen and flow, but consciously.

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2.6. During the whole process, the intention of attaining the subjective experiences that will lead to the proposed goal is always spontaneously present in the experimenter's mind. The leading motive is implicit in his every action.

2.7. We have verified that this volitional element (the intention) works in the nonconscious independently from the experimenter's self-consciousness and will, affecting the inner processes.

2.8. Every apprehension, acquired through contemplation is vivid, like an intense and emotionally felt "living experience" (in Spanish: "vivencia"). This vivid state is produced involuntarily, because of the emotional charge which every apprehension usually carries with it.

2.9. When contents are the object of a specific elaboration by the subject himself, with the help of adequate procedures, inner psychological processes undergo several modifications which produce a transformation of the esthesia. This carries the immediate possibility of getting extrasensory perception.

3. The Process of Contemplation

3.1. Contemplation is the most important tool we can use for the development of ESP. During this comparatively long process, the experimenter goes through several successive stages, in which contemplation arrives at different states, namely:

3.2. Living experience (in Spanish: "vivencia"). The experimenter contemplates the flowing of mind contents. They make him experience the pleasant and the unpleasant. He revives the joy and the grief with all its emotional charges.

3.3. Evocation. The experimenter voluntarily goes back to an episode of his life and contemplates the arising of the corresponding images.

3.4. Objectivation. The experimenter contemplates his own contents face to face, as if they were outside him.

3.5. Dilution. The experimenter contemplates how contents vanish. Their number decreases and images appear with less frequency.

3.6. Emptiness. Contemplation is focused on an expectation, like when listening. The fluency of the contents stops almost completely.

4. Tone and Rhythm

4.1. The internal dynamic of mind contents is determined by the tone and the rhythm, two typical elements of every person's esthesia. Their definition, which requires many assumptions, will not be given in this abstract.

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4.2. The characteristic tone and rhythm of normal esthesia undergo a mutation when contents are put to elaboration through our technique.

4.3. When that mutation happens, a communication between the conscious and the nonconscious takes place. With the help of a change of the existing polarity between both, deep esthesia reverts toward the surface.

4.4. In that way, what has been acquired directly in a nonconscious level casts itself toward the self-conscious. So, PSI arises, manifesting itself under the form of voluntary estrasensory perception.

5. Practice

5.1. The results of our research suggest the convenience of carrying out practices and exercises in groups of three to five persons, with the help of an instructor.

5.2. The instructor's task is to orient the members of the group in a collective way. However, results are attained by each individual according to his peculiar characteristics. The reported results are considered separately, if necessary.

5.3. Each member of the group carries out an individual task outside of the meetings, according to preestablished conditions.

5.4. Only a steady practice can lead to the implementation of the internal mechanisms.

5.5. The conditioning and development of ESP need a long process, which may be estimated in about three years.

5.6. The development of the ESP endows the experimenter with an exact and efficient research tool. However, like when using a microscope, we need a certain ability for determining and identifying the apprehended material. As the experimenter goes on practicing, the instructor identifies the apprehended elements and suggests the procedure to attain the desired results.

6. Some Practical Uses

6.1. It is not our intention to use ESP in order to substitute the usual scientific means used nowadays by physicians, psychiatrists, and psychologists for exploring the psyche. ESP must be used as an extra aid to enable discovery of new and deeper mechanisms of each patient's nonconscious.

6.2. ESP can also be used for obtaining a better and deeper knowledge of the world of the nonconscious. Through systematic group research, carried out by ESP-gifted investigators, it will be possible to know the underlying laws that are still insufficiently known to the world.

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A NEW APPROACH TO METHODOLOGY

[Paper by Dan A. Cetrone, Parapsychologist, Parapsychological Research Institute (PRI), Box 25, West Nyack, New York 10994 in English]

[Text] As chairman of section V, I assume the responsibility of guiding the exchange of papers and discussions. I chose this section because it is the fulcrum of parapsychology--for if we are to justify our interests and dedication to this science, a clearly defined methodology is essential.

All sciences are designed to research the interaction and influence between things, in specific areas recognizable by the boundaries set forth in their generic terms (i.e. biology, chemistry etc.)

Parapsychology, by its very nature, eludes such restriction. All who enter this field, and all those already part of it, come face to face with this unique characteristic. How we deal with it determines the end result of our research. For it would be a far simpler task to borrow the research methods and techniques from the other sciences and apply them to our area of inquiry and in some instances we are able to do this. But with such subjects as out of body experiences, survival of death, and the study of the aura, we are constantly in a quandry re: how to even establish such concepts let alone find out how or why such "things" exist. Even when a lab is set up, the phenomena we deal with isn't the most cooperative as to where and when and to whom it occurs.

The hunger for such "devices" or techniques is dramatically evident in the worldwide reaction to the kirlian device.

As if this isn't enough of a handicap, we have other obstacles to overcome. For example, up until now there was no liaison between industry and our sometimes unique research needs.

At PRI, we approached the problem in three ways:

1. PRI has established a working relationship with several instrument companies.

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2. PRI has a staff of experts in electronics, photography, engineering, etc. capable of designing equipment that either the instrument companies would manufacture or

3. PRI has the capability of manufacturing and/or producing any specialized machine or equipment necessary.

Another obstacle we all face is the acquisition and storage of data. PRI will present the details of its Computer Data Bank System, that will finally make it possible to quickly and easily feed and/or find all the information available on any subject or experiment. The benefits of an International Data Bank are obvious and need not be outlined in this abstract.

Still another obstacle to overcome is the choice of what to investigate which of course is just as important as how.

Parapsychology is, at its present state, unorthodox and we have suffered at the hands of those who, out of scientific cowardice refuse to view or review the evidence before condemnation proceedings.

And now, when at last we are gaining forward motion, from within our own camp, I hear the familiar wail of the coward: "Don't make waves", and nowhere is it more apparent than in the area commonly referred to as "The Occult."

I don't wish to enter into any controversy re: charlatans or semantics or religion or the loss of grants. I would have you see what has been accomplished at PRI, through a subsidiary called COPE [Conferences on Personal Evolvement].

PRI approaches each area of research with one (ultimate) criteria: Will the results, in any way, enhance, encourage, promote and propagate that one natural resource in all of us: Human Potential?!

When the research points in this direction or towards alleviating human suffering, we proceed and present our findings via courses, classes and/or seminars through COPE. These seminars are designed for the professional as well as the layman.

The following is a partial list of the subjects investigated and presented in this fashion:

Psychokinesis, Telepathy, Precognition, Divining, Psycometry, Psychic Healing, Astrology, Tarot, Aura, Yoga, I Ching, Automatic Writing, Palmistry, Hypnosis, Spirit Photography, Teleportation, Reincarnation, Spiritualism, Kabala, Color, Numerology, Physiognamy, Graphology, Dreams, Deja Vu, and Witchcraft.

We have just completed a seminar on Acupuncture, for Oral Surgeons.

The results in registration and attendance are proof positive of the correct decision to create COPE. If there is an area that doesn't "belong" to

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Parapsychology, then let us first investigate, otherwise we are guilty of the very action and reaction that has prevented us from receiving the recognition and acceptance due us.

The area of "The Occult" has yielded, and continues to yield impressive results. Data on these investigations is available to interested parties, in addition to (what will be an incentive to those previously hesitant) the reports that will be given at this conference.

The final obstacle I will deal with here is financing. Many of us are quite capable of designing proper research projects in specific areas. So what--it's all on paper and without the other paper ($$$) your talents mean nothing. Research money has to be available for legitimate endeavors.

PRI again met the problem head on. In addition to annual monetary awards for outstanding research, PRI will be a source for research funding, without the usual politics of favortism, coercion and restrictions that prevent true research. This will be the substance and guidance for my chairmanship along with an eager and open mind for the views held by the other participants.

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SOME RECENT ENGLISH PUBLICATIONS ON PSYCHOTRONICS

[Paper by Manfred Cassirer, M.A., B.Litt., Paraphysical Laboratory, Downton, Wiltshire, England in English]

[Text] Of late, I have engaged in a fair amount of reading and reviewing of books dealing with various aspects of the subject, but written for popular consumption rather than for specialist students. In the case of some of these, it would perhaps not be too unkind to suggest that the author's main object has been to cash in on the market for, as you know, there is now a world-wide interest in anything even remotely touching on Psychotronics (especially among the young), several publications on the subject having even become best-sellers. As foreign books may not always be readily available in your country--it is sometimes difficult to obtain them in England--I thought you might be interested in obtaining some idea of their quality and general approach, the more so as matters of real interest are often touched upon.

I shall confine my survey of the literature to a selection from a series called "Frontiers of the Unknown", which is somewhat typical in revealing both the merits and the shortcomings of modern popularizations of our subject. The series in question is edited by Dr Tabori, the literary executor of the late Harry Price, about whom more anon. Needless to say, standards differ in different volumes, and I pass over in tactful silence one which is commendable for the quality of its illustrations only! Another, "Beyond the Senses," by Phyllis Raphael and the editor of the series, shows painfully unmistakable signs of having been put together in haste. Although clearly addressed to the layman, its references are too cryptic to be meaningful to him. Such deplorable adjectives as "supernatural" are liberally employed, and not with reference to a perfume of that name! Nevertheless, it has much to commend it, as can be seen by referring to the topics, which range from "Faith Healing" as practices by George Chapman and Harry Edwards in England to the "Lourdes Miracles" and the "Psychic Surgeons," the late de Freitas of Brazil and the now largely discredited "Dr Tony" of the Philippines. A chapter entitled "The Invisible Eye" is nonetheless of interest in recording personal experiences with contemporary sensitives. The author's discussion of Bridey Murphy, the well-known American case of regression under hypnosis, is followed by what

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some consider the most fascinating incident of all, Harry Price's "Rosalie Seance." This, you will remember, concerns the alleged materialization, in the darkened living-room of a private house in South London, of the small girl, Rosalie. Price vouched for it by and large, and, after much controversy, he is said to be now "vindicated." In fact, as so often in our intractable subject, no definite conclusions can be reached either way and few would agree with any amount of confidence that it "proves," as alleged, "how the most experienced and most conservative of researchers"--the author's quaint description of Price--"can be fooled," a verdict precariously based on a dubious and anonymous "confession."

Mr Peter Underwood is President of the Ghost Club in London, an organization which purports to investigate hauntings and apparitions and similar phenomena. He needs little encouragement to air his views on "Sex and the Occult," a suitably commercial aspect of Psychotronics. A disappointing feature of this exercise is that no proof is offered in support of theories which, he implicitly admits, are little more than ad hoc improvisations. Moreover, Underwood evinces an at times surprising lack of insight in failing to recognize plainly psychogenetic constructs with archetypal connotations, which he naively accepts at their face-value as the traditional "ghostly nuns and monks." For, suspiciously often, these alleged monastics are no more than indistinct, nebulous shapes or figures with features either concealed or in total abeyance. They are anonymous to the point of complete self-effacement and absolute dehumanization, thus forfeiting all claims of belonging to our species, whether incarnate or discarnate.

We have already referred to the inadequate preparation which mars certain sections of this book. Tabori and Raphael state that Rudi Schneider, the brilliant Austrian sensitive, was finally accused by Price of "freeing one arm from the electrical control" (my italics), which Price had specially installed in his laboratory. On the contrary, the purpose of this quite unjustified accusation was to show up the alleged inefficiency of the manual (or tactual) type of control, to which the investigator had rather inconsistently reverted by that time. The authors have slipped up indeed in missing the point of Price's so-called exposure, which, by a strange twist of irony, has since been denounced as suspect in its turn!

Another volume in the series can be recommended with very similar reservations. It imparts valuable information about such famous researchers of old as Hereward Carrington, an Englishman who lived and died in California (not to be confused with Whately Carington), Sir Oliver Lodge, Charles Richet (the Nobel Prize Winner), Dr Schrenck-Notzing of Munich, and the Italian criminologist Lombroso. No one would quarrel with this necessarily arbitrary selection if it were not for the gratuitous inclusion of a sensitive (Schermann). As "Pioneers of the Unseen" performs a reasonably useful function in instructing the general public in a stimulating manner, we may overlook some of its minor faults, however irritating, particularly in terminology, to concentrate on more serious error, as when Mrs Piper is described as a "physical medium."

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SOME RECENT ENGLISH PUBLICATIONS ON PSYCHOTRONICS

[Paper by Manfred Cassirer, M.A., B.Litt., Paraphysical Laboratory, Downton, Wiltshire, England in English]

[Text] Of late, I have engaged in a fair amount of reading and reviewing of books dealing with various aspects of the subject, but written for popular consumption rather than for specialist students. In the case of some of these, it would perhaps not be too unkind to suggest that the author's main object has been to cash in on the market for, as you know, there is now a world-wide interest in anything even remotely touching on Psychotronics (especially among the young), several publications on the subject having even become best-sellers. As foreign books may not always be readily available in your country--it is sometimes difficult to obtain them in England--I thought you might be interested in obtaining some idea of their quality and general approach, the more so as matters of real interest are often touched upon.

I shall confine my survey of the literature to a selection from a series called "Frontiers of the Unknown", which is somewhat typical in revealing both the merits and the shortcomings of modern popularizations of our subject. The series in question is edited by Dr Tabori, the literary executor of the late Harry Price, about whom more anon. Needless to say, standards differ in different volumes, and I pass over in tactful silence one which is commendable for the quality of its illustrations only! Another, "Beyond the Senses," by Phyllis Raphael and the editor of the series, shows painfully unmistakable signs of having been put together in haste. Although clearly addressed to the layman, its references are too cryptic to be meaningful to him. Such deplorable adjectives as "supernatural" are liberally employed, and not with reference to a perfume of that name! Nevertheless, it has much to commend it, as can be seen by referring to the topics, which range from "Faith Healing" as practices by George Chapman and Harry Edwards in England to the "Lourdes Miracles" and the "Psychic Surgeons," the late de Freitas of Brazil and the now largely discredited "Dr Tony" of the Philippines. A chapter entitled "The Invisible Eye" is nonetheless of interest in recording personal experiences with contemporary sensitives. The author's discussion of Bridey Murphy, the well-known American case of regression under hypnosis, is followed by what

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Elsewhere the author is either secretive or ill-informed in concealing from us the true identity of the famous Society f. Psychical Research automatists "Mrs Holland" (Kipling's sister) and "Mrs Willett" (Mrs Coombe-Tennant), or when he refers obliquely only to the Parapsychological Association, the distinguished international professional organization of workers in the field of Psychotronics, which made history by finally becoming affiliated to the American Association for the Advancement of Science in 1969.

Writers of introductions to our subject are fond of summarizing lengthy reports on sittings with sensitives. Close scrutiny of the original documents often leads to uncertainty as to the writer's perseverance in following the arguments, especially when the summary seems but loosely related to its prototype. Again, insufficient acquaintance with the older literature may result in unjustifiable implications, such as that hyperaesthesia is a new field, when in fact it was intensively studied in 19th century Germany and elsewhere.

As you will have guessed by now, the choice morsel has been held in reserve for the final section. "Crookes and the Spirit World" is "a collection of writings by or concerning the work of Sir William Crookes, O.M., F.R.S., in the field of psychical research." Based on the researches of the late Dr Medhurst and of Mrs K. M. Goldney, it is graced by an excellent introduction by the latter, while the material has been competently edited by Miss M. R. Barrington, an eminent Council member of the Society for Physical Research. A work by such leading authorities can hardly fail to be of interest, even if not much new material is presented within its 250 pages, no less than half of which are taken up by a timely reprint of Crookes's "Researches in the Phenomena of Spiritualism", for all too long out of print. Crookes's unique accounts of his experiences and investigations cannot fail to fascinate even the most unimaginative, and make the science-fiction writer look a dull dog by comparison. In them, we seem to be transported from the proudly proclaimed age of 19th century rationalism to the dim past where magic and make-believe render almost nothing impossible. Objects move without discernible cause, men are levitated into the air and fly about like birds, things appear from nowhere, strange figures and hands mysteriously materialize, accordions play untouched, and even the passing of matter through matter has become a demonstrable fact. And yet all this, it is claimed, is neither fiction nor fabrication but solid data presented and vouched for by one of the leading scientists of the Victorian era, backed up with the massive authority of the highest academic honors of his country. Few then would disagree with Lodge's famous verdict that "It is almost as difficult to resist the testimony as it is to accept the things testified." And yet, as Mrs Goldney points out in the Introduction, there is probably not "a single researcher of repute...who would credit Crookes's own account" of a fully materialized girl sitting in his (Crookes's) own living-room and amusing his children.

The position is quite different, with regard to his equally famous "Sittings with D. D. Home." Reprinted from the Society for Physical Research's Journal, they take up another 80 enchanting pages of the present collection. Even the most violent denigrators of Crookes nowadays admit the validity of his

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experiments with a sensitive whose reputation was almost equal to the scientist's. This was no mean achievement in a vocation (physical mediumship) where the suggestion of fraud is never far from people's minds. In the west at least, sensitives prefer to remain on safer ground and prudently tend to steer away from these more evidential but also more perilous paths. D. D. Home was unrivalled and in many ways unique even in his own age, and his scrupulous investigation by the outstanding scientist, who was rewarded with fierce hostility and ridicule, marks a milestone in the history of our subject. Even today only a handful of experts are familiar with it, and it is to be hoped that the volume under discussion will effectively dispel this deplorable ignorance and urge on others to continue his work.

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PSI-PHENOMENA FROM AN EVOLUTIONARY-INTERACTIONAL POINT OF VIEW

[Paper by Jeno Miklos, Licenciate in Chemistry, Medical Research Center, Academy of Medical Sciences, 16,Boulev.Dr V.Babes, Timisoara 5, Romania in English]

[Text] Since the recorded history of human civilization several attempts had been made at a comprehensive and unitary view of the wide scale of natural phenomena. Along this same line of 'illusive' (as related to the ever-growing feature of the knowledge of external world and of ourselves as well, versus 'definitive' theoretical constructions) endeavor, I am for some years searching for such a unification in terms of Interactions ("Towards a General Theory of (Specific and Non-Specific) Interactions Between Material Systems", a series of manuscripts in preparation). Before turning on details, let me draw attention to a recent survey[1] of V. Sahleanu (of the Bucharest Anthropological Research Center), who is trying a unitary encompassing by means of the information concept, pleading for an 'Informational Universe'[2].

Given the ubiquitous wide-spreading of interactions throughout all levels of organization of matter, I would speak, by paraphrasing Sahleanu's term, of an Interactional Universe. For, interactions--whatever their kind or degree --do occur beginning with the smallest units of matter, elementary particles, through atoms and molecules, living cells and organisms, up to populations and even civilizations! (for the latter one, see[3]). Despite the apparent heterogeneity of the media the red-thread of Interactions is conducting us through, it not only serves as an orienting guideline, but it comes also to provide a clue to newer insights to delimiting (or, conversely, bringing near) organization levels or systems hierarchy. If one considers three principal types of interactions between material systems as follows: energetical, substantial (derived from substance) and informational[1], then one can with easiness reach at an evolutionary conception of the interaction-types themselves. In this way, the energetical type is featuring, e.g., the realm of the elementary particles (electromagnetic, strong and weak interactions, respectively; cf., e.g.,[4]). Substantial interactions are characteristic of, among others, the macroscopic level, manifesting themselves, for

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example, as gravitation. However, these kinds of interactions are too 'coarse', lacking for any specificity when directed upon targets. Interactions underwent evolution, simultaneously with matter's 'ascent' on the organizational (or, in Pigen's[5,6] terminology: 'self-organization'; one can speak as well of 'self-assembly') hierarchy. With the appearance of life, the biomacromolecules (=biopolymers, such as proteins, nucleic acids etc.), beyond the primary (covalent) bonds known already earlier, did introduce to scene secondary valences (termed also 'weak interaction'[7], yet not connoted with those from elementary particles), which came to add new (steric) dimension to interactions by conferring them specificity -that was conformational (secondary + tertiary structure) complementarity, such as enzyme substrate or antigen-antibody fitting in a key to lock manner; this is the case of recognition between biomolecules[8,9]. Intraorganismic biocommunication[10] (mainly of regulatory type, mediated by e.g., hormones) has 'grown up' to inter-organismic communication. In this sort of interaction -for example electric signals, ultrasound waves, (sex) pheromones (by insects, butterfly species)--substantial and energetical aspects were playing only a role of signal in both amount and degree, respectively. Consequently, one has witnessed the evolving of the informational type of interactions. Indeed, there are processes wherein the informational aspects are overwhelmingly more important than energetical and substantial ones. This may be the case with psychological (human communication[1]) and psi-phenomena[11]. This is one of the alternatives for avoiding the withdrawal of parapsychological occurrences from a materialistic framework.

J. B. Rhine says: "It becomes necessary (...) to infer from the results on record that an *unknown energy* is operating in the psi process"[12], and he hypothetically calls it psi energy. Vasiliev in the concluding part of his book[13] supposed that "If the electromagnetic hypothesis will be definitively denied(...) then, of course, there is the brain that--as the most highly organized matter--is producing a new factor, very likely of energetical nature (...) One must search for something radically new one." Both--otherwise obviously related -conceptions can be easily accomodated with the interactional viewpoint: each organizational level (or system) of matter has its own kind of interaction, and psi may well represent one of the hierarchy's compartments. And, in addition, I should like to point on, that psi-interaction is perhaps the most specific among all types of interactions, requiring the least, if any, substantial support and the smallest, if any, energy. This highest degree of specificity is ready to account for the well-known lack for 'exigence' as regards distance and barriers in psi occurrences.

Finally, still a point on the extrasensorimotor character, apparently implied in psi-phenomena. In a general theory of interactions between material agents each interactant has its (specific or nonspecific) 'receptor' (in a generalized sense of meaning), by means of which interactions not only occur, but, in addition: are observed ('sensed') (Observation itself is underlied by interactions). Quoting again from Rhine: "...psi can only be detected through conversion to directly registrable readings of another energetic form. For example, it is only as some observable physical process can be

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influenced by PK (psycho-kinesis) that this type of psi function can be manifested and measured." I think that psi (ESP and PK) is not just as exclusively extrasensori-motor as the semantic content of the term would imply it; or, to be on the safe side, it is only partially and not entirely so. For, once psi-interaction did actually occur and was observed, registered or related, sensorimotor (or, largely speaking: 'normal') abilities have been sine qua non involved. This holds for the whole range of psi-phenomena with an almost total lack for exception. Take, for example, telepathy: whatever the nature of the message, it had to be emitted from a sensorimotor source (say, e.g., the memory of the agent), and then (after interaction) once again, it had to be registered on a sensorimotor tape of the percipient; that is, while the whole process, 'normal' information processing is involved at least twice. Psychical healing is another sort of psi, wherein interaction between normal and paranormal does occur. Pursuing further Smith's original (and ingenious!) biochemical approach[14,15], there may be said that paranormal (inter)action is registered by enzymes, resulting very likely in their conformational (that is activity) restoration; herewith we have an interplay (and interconversion, as well) between two different levels' interaction-types. To take a still other bio-PK, consider now PK on living cells or tissues, influencing their growth. Again, one must stress, that regardless of the stimulus' nature, established genetic regulatory mechanisms are involved: regulatory genes triggered (switched) on (=growth) and off (=growth-retardation), respectively. All in all things look like as if matter were to be a mosaic of 'receptors' for interaction-potentialities (both normal and paranormal), with real occurrence of interplay (or interchange) between them, whatever their type and organizational level they belong to. Perhaps, there is not failing to draw a parallel to the case of particles and antiparticles, wherein--though so sharply separated (conceptually)--interactions do occur too (cf., eg.,[16]).

Summa summarum, I am arguing, that the interactional point of view as introduced above, is coming to furnish us a newer alternative towards a unitary view of natural phenomena (including psi, also) and attempting at to safeguard from irreversible splitting into sharply separated entities of psi and non-psi. For, such a disentanglement would forever preclude integration of psi into the general scheme of science, so often claimed by most parapsychologists.

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THE SUBJECT AND HIS ENVIRONMENT

[Paper by E. Stanton Maxey, M.D., F.A.C.S., Ocean Boulevard Medical Center, Stuart, Florida, in English]

[Text] My topic is the Subject, man himself, and all creation, man's environment. This paper will address itself to a formation of a concept of man. Just what do I mean when I say "I"? What does the "I" of me include and what does it exclude? What are the temporal relationships of the "I" of me? It quickly becomes rather obvious that the "subject" is a very abstruse matter indeed and one which can be understood only in terms of relationships rather than in terms of concrete things.

Man's environment includes all forces which play upon the "I" of his total being. As such it includes all factors perceptible to man's consciousness via the seven senses as well as forces not yet consciously recognized. The matters of light, gravity, air, water, soil, electrostatic magnetic and ionic atmospheric factors, must all be considered in their relationship to living cellular and syntropic organismal beings with their associated emotional and intellectual inner environments. Since extraterrestrial forces affect Earth's fields, these too form a part of man's environment. Since science is beginning to accept and prove the "ether" this too becomes a part of man's environment.

Evidence that man is a symbiotic being within a massive hylozoistic universe naturally grows out of any consideration in depth of man and his environment.

Biologically man originates as a unicelled organism within the mother's womb. Darwinian theory teaches a similar historical beginning. As an adult he is an extraordinarily complex organism consisting of billions of highly specialized cells affixed to an internal skeleton permitting mobility within his geographic environment. His sense organs permit an unparalleled environmental contact via touch, taste, hearing, sight, and smell; all of these are poorly understood. Consciousness might be called man's sixth sense; by this I mean that man is aware not only of his biological structure and to some degree,

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his external environment, but he is also aware of the fact that he is aware. Scientists know of no other creature which is aware of its own awareness. The seventh sense which is posited relates to man's awareness of his own soul, psyche if you like. The sciences of psychology, psychiatry, parapsychology, psychotronics, psychokinesis and a host of others have come into being to explain to man his awareness of his own soul.

A proper sense of perspective may be achieved by admitting that the foregoing statements have both said a great deal and at the same time nothing at all. Let us illustrate. The human biological structure is by weight approximately 88 percent water; yet we know very little about water. Nobel Laureate Dr Linus Pauling proposed a clathrate hydrate structuring which explains some physical properties but not all. When water is broken up into small particles the naturally occurring ionic charges may be either positive or negative. Some water freezes only at 169° F. below zero. Though chemically not changed water after exposure to 1,000 oersted magnetic field dissolves scale from industrial boilers and if fed to guinea pigs causes them to diurese and become ill. The progeny of these pigs will be undersized through the third generation. This exceedingly complex problem of water merely demonstrates the magnitude of the complexity of cellular systems, especially the multicellular organism called man.

Thus we have in man an astoundingly complex electrical being. Some of the isolated electrical qualities will be demonstrated via acupuncture point determinations. A field meter will be used to demonstrate man's total field qualities and comments upon how these phenomena relate to disease and physiological sleep will be directed toward a concept of man as an electrical being. Dr Andrija Puharich demonstrated that persons could be taught to hear with electrical devices attached onto the skin in areas unrelated to the acoustic nerve and thus the seat of the hearing mechanism comes into question in much the same way that seeing with one's fingers challenges accepted optical neurological precepts. All men are, by experience, aware of their five senses but where cognition of these senses takes place must, for the present, be left open for further study. Has a scientific measurement of cognition even been accomplished? One must answer "no", yet each of us is aware of the "I" within himself. The question must be formulated "is awareness less a fact than that of which we are aware?" Is awareness a field phenomenon?

Some discussion of man's seventh, soul or psychic, sense naturally turns to the Bridie Murphy phenomenon which has been extensively expanded by Dr Ian Stevenson; he has now collected several thousand cases of "proven reincarnation." The corollaries these concepts have with those which are used by Dr Denys Kelsey psychotherapeutically (namely that psychic disturbances may manifest in one life time but originate in a prior one where psychic stress was unresolved prior to death) lend credence to cognition as a field phenomenon as do certain electrical skin measurements of sleeping persons. Some results of Kirlian photography permit a similar analysis. Mendelian genetics can not explain such psychic memory in terms of DNA/RNA components, however, Jinarajadasa must be mentioned as the originator of the genetic concept.

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A consideration of light, of electrically charged particles (ions), of electrostatic fields and of magnetic fields and how they affect both biological systems and cognition need not become abstruse. We have seen how Dr Szent-Gyorgyi established the importance of the photon in living systems and how such light is stored by plants in ionically charged particles; thus we immediately see that man exists only symbiotically in relationships to the plant world. Man's internal cellular light environment is gauged by his body temperature; thus we see that cellular metabolic production, or rather release, of light is perhaps the critical function of cellular chemical machinery. One can demonstrate that light is augmented from without by observing the surface luminescence associated with passage of endoscopic instruments; if light will pass from within out obviously it must also pass from the outside inwardly. Since psychologists have shown differences in learning and mental capabilities among American Negroes, Indians and Caucasians unrelated to environmental (social and economic) background are these variations related to skin color modulating the light which filters into the internal cellular milieu? If this be true all factors which modulate light must affect both cellular machinery and the higher syntropic function of cognition. Electrostatic fields via the Kerr effect and Magnetic fields via the Faraday effect can thus affect biological systems both by the manner in which they modulate light and by their influence on directional travel of ions. Jupiter is known to emit 10^{14} times the radio energy as is emitted by our Earth's Van Allen belts and some of Jupiter's energy therefore must affect our internal cellular machinery and possibly our cognitive processes as well. A deciphering of these relationships may well make a science of astrology. That the rapidity of some nonliving colloidal chemical reactions is related to planetary positions has been conclusively established by Michel Gauquelin's prolonged study of these phenomena.

The general conformation of the Earth's magnetic field is revealed by the slide (slide shown). Man, like other animals, as described by Dr A. S. Pressman has his own biological magnetic field and if suitably floated in an isolation chamber will align himself transversely to Earth's magnetic lines of force. Fluctuations in the Earth's magnetic field strength are associated notably with lunar phasing and this phasing is observationally related to growth of both plants and animals; growth occurs predominantly at the peaks and valleys of field strength associated with the moon phasing. Human leukocyte counts fluctuate in like manner. Statistical observations reveal that this phasing is also related to our emotions for both crimes of violence and lunacy manifest predominantly with the full moon. Physicians are becoming aware that the farmers are correct in associating bleeding tendencies with lunar, hence magnetic field strength, phasing. Again we can rely upon personal experience to clinch the proof; any of you who care to reflect upon your extracurricular student activities during your ages of, say 15 to 25, will agree that lunar phasing affects emotions in the species homo sapiens. H. Konig, physicist at the Meteorological Institute at Hamburg, has shown that magnetic field fluctuations of 3-5 Hz affect human reaction time and are statistically related to industrial and road accidents. Your author has for some time been

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calling this work to the attention of appropriate agencies in the United States because air traffic accidents appear to be similarly related and cockpits of aircraft lend themselves to electromagnetic conditioning which will protect passengers.

Physicist, Dr Bob Beck, has studied the Schuman resonance (3-13.14Hz natural Earth resonance) in connection with EEG instrumented sensitives and shown the "illuminating episodes" to be associated with an EEG running a parallel frequency and in phase with the Schuman resonance. When man is the receiver of provable meaningful information who is doing the sending?

Dreams and "out-of-body experiences" demonstrate a mobility of the "I" of man separate from the physical body and often into a foreign time dimension. Are these phenomena associated with an "ethereal body" functioning within the "ether"? J.J.J. Pages has examined the action of the electron and shown that it behaves in the "ether" as a spinning mass with antidonderal qualities.

Man may be defined as a complexity of subatomic fields, within atomic fields, within cellular fields which make up organismal fields; these in turn exist within gravity fields, magnetic fields, electrostatic fields and light fields. Cognitive man of seven senses is dependent upon all of them. Under special circumstances, e.g., with dreams, meditations or "out-of-body experiences" the "I" of man functions independently of physical being and time. Because man receives meaningful information in such states we ponder on the origin of such information. Who can say that the fluctuations of magnetic and electrostatic fields upon the surface of our sphere are less indicative of a planetary consciousness than an EEG is evidence for mental activity or an EKG evidence for life in one of God's creations, man?

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COINCIDENTAL STATES IN PSYCHOTRONICS

[Paper by Engr Ivan Doskocil, Czechoslovak Scientific and Technical Society, Section for Psychotronics, Prague, Czechoslovakia, in Czech]

[Text] Every person has an apparatus that enables him to detect the state of other people, and to filter out the distortion with which another person deforms the external manifestation of his feelings. Something in us reliably detects even the smallest trace of insincerity, irriation, envy, greed, etc. It is difficult to transfer this detection to the plane of mental analysis. Communication is multichanneled: the words tell us one thing; the intonation expresses another thing; the eyes and the hands, something else; and overall behavior in context with its circumstances, again something entirely different. But if in a peculiar way we find the result of this communication sympathetic, then this same apparatus causes us to unconsciously begin reproducing the motions of the other person, his facial expressions, to start using the same intonation, the same words, etc. In everyday life we regularly encounter this tendency in man to unconsciously project himself into some object in his environment, i.e., to imitate the object's behavior (empathy).

In the view of the Soviet psychotherapist Levi [1], empathy is a certain type of mental echo. He not only regards it as an important biological and physiological phenomenon, but also believes that it is the basic element of social psychology. Its mechanism is the basis of the process of learning. We know that children in particular are almost ingenious unconscious imitators. In contact they frequently react with the simultaneous movement of their lips, and they copy complicated practical activities completely, even with their posture, gestures, and with fine nuances in eye motions. It seems as if they were directly absorbing experiences for their future life from our behavior, mutual relations, and from events themselves. Their perception of the world is more like the nondifferentiated, syncretic and synesthetic perception of primitives rather than our perception, and their life is formed within a narrow circle that abounds in the present. The child's effort to establish a "direct relationship" with an adult resembles contact with the "alter ego" that lives and functions in his mind in a similar manner [2].

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The deep and spontaneous sense of identity that is dominant in the child's world usually disappears with the separation and development of his conscious ego. Yet we encounter manifestations of unconscious imitation also among adults, particularly the two most catching ones: yawning, and coughing in public. We succumb to them regularly, without seeking the source of the corresponding internal urgent feeling. The mechanism of motion empathy acts in the same manner. This mechanism is responsible, for example, for the sport fans' feeling of actually playing when they watch an interesting game, or for the aching feet of an impressionable girl who the night before went to the ballet (she wakes up tired and sore but is not amazed, because "somewhere inside" she danced with the performers). For this very reason we find disagreeable the presence of persons who perform violent motions, because in our brain there arise strong impulses to involuntarily imitate them, and we must suppress these impulses. This process takes place at the unconscious level, but we feel the tension. We also find it difficult to communicate with a person whose rigid facial expression evokes in us a feeling of reticence.

Levi includes among the cases of motion empathy also the epidemic of paralysis in Italy in the 16th century, the so-called Saint Vitus dance that swept Europe in the 14th century,[1] many cases of mass panic and flight, mass phenomena of convulsive frenzy among fanatical sects, and also spiritualist seances as an excellent example of the mutual transfer of motor impulses due to the resonance of the participants' unconscious.

A higher degree of imitation is the emotional echo that usually accompanies the mechanism of motion imitation. Laughter, irritation, nervousness and anxiety are transferred very easily; the channels of such transfers are motions, breathing, intonation, facial expressions, etc. Also internal tension, and the intensity and course of emotions are recorded at the level of the unconscious. In some people there is an almost ideal reflection: as you approach them, you see your own image. You get the impression that they have completely projected their feelings into you, but they are not necessarily aware of this. This entire process takes place automatically, and all that we know of it so far is that it exists. We have a tendency to identify with the pleasant, and the "attractive forces" of sympathy increase with the degree of identification. In practical interpersonal relations the gradual process usually is interrupted by the instability of the psyche itself, or by instinctive fear "of the unknown that awaits us." The symmetrical process thus changes into regular asymmetry: one individual experiences a certain state, while the other experiences the exact opposite, and there arise tendencies of repulsion. The two characteristics alternate in communication, and it is very likely that over all this there functions the mechanism of changing role, conditioned by an unconscious view of ourselves through the eyes of others.

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The automatic processes of imitation, which sometimes extend as far as an irrational tendency to identify with some object in the environment, are of much greater importance in our lives than we realize. Therefore it will be in order to begin considering the possibilities of a subject's empathizing with some external object, by projecting himself into the reality of the object's space-time conditions. If consciousness is a mirror that reflects the outside world and the internal state of the organism (a subjective reflection of objective reality), then conversely all psychic events have their inverse reflection in the physiological reflexes emanated by the entire body. In their public performances, therefore, Messing, Kuni and others perform some task that a person writes down on paper and then gives to an impartial referee for control. Messing takes the person's hand and thus connects his unconscious system with that of this person, forming an integral whole. Any ideomotor manifestation of the hand, including a change in the pulse rate, is reflected in him in the corresponding manner. It then depends only on his skill to map the entire terrain so as to proceed along the "target gradient," by eliciting the "maximum" ideomotor or pulse reaction in the hand.

Also in the process of mental activity the object produces an immense number of involuntary and unconscious motions, and therefore the object's external appearance, including his facial expression, corresponds to the given mental activity. A knowledge of this principle and further training enabled, for example, the philosopher Campanella to "read" the minds of others. If he wanted to determine what was taking place in the mind of another person, he reduced by relaxation the threshold of his own consciousness and strived to imitate in himself the given object's expression, i.e., to purposefully project himself into the object's state. On the basis of his own state and of the thoughts that it induced, he then made successful conclusions regarding the content of the object's thoughts.

Psychologists today are unanimously convinced that geniuses during creative activity have the ability to project themselves into their artistic works so that they practically identify themselves with their works. When Tschaikovsky completed his "Pique Dame," he wrote in his diary: "I wept bitterly when German died." Describing the death of Madame Bovary, Flaubert projected himself into her state to such an extent that he showed symptoms of poisoning, including sharp abdominal pain and vomiting. Describing the Battle of Slavkov, Balzac heard the cries of the wounded, cannon salvos, and the firing of rifles. Some composers (for example, Dvorak) and writers (Tolstoj) took pen in hand only when they were unable to resist the sounds heard internally or an instinctive urge to write. Outstanding musical interpreters (Paganini) actually did not interpret but transformed the works in accordance with their own internal sequences of imagery, and thus their music had a fascinating originality.

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Also some scientists are able to rapidly orient and assimilate themselves to their experiments or the objects of their research. The manner in which some scientific discoveries were made (Medeleyev, Kekule, Plank, Einstein), and the foregoing warrant a certain generalization: the final phases in the investigation of any objects that exclude an analytical and logical approach are of a similar coincidental nature. The solution comes in a different way, through synthesis and intuition, through empathy after brief or long preparation, the purpose of which is to overcome the object's "resistance," and to assimilate to it as completely as possible. In the course of this, a common structure of the integrating subject and object arises, some sort of "miniature copy" of the object is formed in the subject. Finally, after the necessary relaxation of consciousness, there occurs -- often without any perceptible effort -- the final completion of integration, which permits a peculiar "feeling" of the object's structure, similar to the subject's feeling his own internal state [3].[2] In distinction from the logical perception of the object, intuition is in the nature of feeling the real essence of the object.[3] Because of its directness and complexity, intuition assumes the nature of obvious truth that does not require rational substantiation; it becomes a peculiar criterion of the truth of its own results.[4]

Let us now attempt to analyze in greater detail the ideal case of a subject's deep empathy with an object that precludes sense communication.[5] Assume that at the time of the experiment the subject fulfills the following conditions: he is free of all ties to the outside world; his body is relaxed but in a fixed position; his breathing is regular to such an extent that he would be able to hold his breath for some time, without any difficulty; and all his senses are introverted so that he is not receiving any stimuli from the outside environment, including his own organism. Assume furthermore that the subject has attained perfect passive concentration, necessary to keep his attention on the particular image of the object.[6] Simultaneously, he has taxed his memory to accurately recall the object, its shape, color, smell, etc. Finally, he has intensified his effort to recall, so that the image will not be static but will have "a life of its own."

If the subject meets these conditions, he begins to meditate. His concentration is now uninterrupted, continuous, and lasts by intertia until it is halted by another conscious act of the will. The subject is concerned only with the given object and is aware of only what enters his consciousness from the object. At this level there occurs a practically perfect single-point imagination of the object that is experienced "outside," i.e., as an external projection. In external space, however, the object appears not as a mere eidetic vivid image but as a "counterpart" that is unique. Everything else is merely the background from which the object emerges, and not its limit and scale. It appears in time, but in the time of the event that in itself is complete; it is experienced not as a mere part of a continuous and clearly divided sequence, rather as

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a present existence, as the only being present. Although still separated from the subject, the cognitive process itself assumes a new quality: the object appears as that which acts, and simultaneously as that which is acted upon but is not included in the causal chain and instead, in its interaction with the subject's consciousness, is the beginning and the end of the event[2]. This direct relationship includes all the features of perceiving the individual properties in the same way as in the wakeful state, and they are combined into a single, synesthetically perceived whole. The relationship is simultaneously both passive and active; it resembles active imagination, but one that is concentrated exclusively on the object. In it the subject actually feels that the object is real.

It is very difficult to understand what is happening subjectively and objectively when meditation is controlled and intensive. Ossovietski said: ". . . I projected myself into visual images. I gradually conquered time and space, and at the same time I felt as if at the boundaries of these visions I were losing my own personality" [7]. Statements by other sensitives likewise agree in that they, at this level of meditation, sometimes lost their awareness of their own personality, commensurately with the extent to which they identified with the investigated object's image. Some felt that they were getting inside the object. Others felt the object merely as a glare, while the initially ideal external projection disappeared. In still others, the process occurs in skips, especially if it is not sufficiently controlled, so that they are unable to analyze the process retrospectively; all at once they find themselves at a different point of the object's space-time. When the object is a person, some sensitives describe their states as "dual," if the conscious ego is not completely replaced; they begin to use the same words and expressions as the person with whom they identify. It seems to them as if their soul were split, and they report that the success of the psychotronic experiments depends on the extent to which their conscious ego is withdrawn.[7]

To establish immediate contact with the investigated person who is removed in space (and sometimes also in time), some clairvoyants use inductors, objects that belong or belonged to the given person.[8] Up to now the term inductor was applied only to an object, or to a person who "sends" in a telepathic experiment. However, various cases indicate that an inductor may be also a name and address, a name and the date and place of birth, mere knowledge of a characteristic feature of the investigated person's face (for example, a scar), sometimes the content of a telephone conversation, in other instances an unambiguous event, the assignment of a certain task, the environment of a certain place, the image of this environment, or merely the image of an object that we wish to investigate. In general, then, an inductor may be anything that is able to unambiguously characterize the investigated living or nonliving object. If the inductor does not have this unambiguously determining property, in the optimal case we can expect that in

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the projections there will appear a set of objects with the common characteristic, but it will be very difficult to distinguish them in terms of time. An inductor in this sense functions as a medium, as an initial point of concentration and meditation. It is similar to the input data fed into a computer of unimaginable capacity, the base of the collective unconscious. It is the base because the contents of the the conscious and of the unconscious subject the expected information content to undesirable changes. At best, this information is transformed into symbols; at worst, the information is lost in the organism, vegetatively or humorally.

Let us return to our initial objective. We have analyzed the ideal case of the subject's concentration on the image of an external object, called an inductor, while any possibility of sense communication with the object was excluded. We assumed that the state of concentration changed to meditation, a state of a continuous flow of information from the object's image, and to a new and higher state of wakefulness in which the subject gained qualitatively new information about the object, by partially identifying himself with it. In the literature on Yoga, this state is designated as Samadhi.

In the same manner, all the other phenomena that cropped up in our discussion can and must be analyzed from several points of view. Evidently a comprehensive view of the entire field of psychotronics will long remain an open problem.

FOOTNOTES

1. According to Jung, the collective unconscious is activated during such epidemics.

2. Sergeyev [4] and others point out that such states in subjects of psychotronic experiments correspond, according to their electroencephalograms, rather to states of relaxation with a transition to "creative states," while the subjects remain fully awake.

3. According to Bergson, through intuitive empathization we project ourselves into the object so as to experience harmony with what is unique in it and hence is inexpressible.

4. The final act of the object and subject's integration evidently occurs at the level of Jung's collective unconscious, or more accurately at the level of its base comprised of "archetypes as such." Jung calls them psychoids and they are of a dual, psychic and material, nature. He distinguishes them from the so-called "archetypal contents" of an exclusively psychic nature. These occur as similar motives in the myths, stories, dreams, etc. of all nations, and they are responsible for the primary deformation of the absolutely

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pure perception of the essence. The "archtypes as such" have an organizing and forming influence on the "archetypal contents"; they are the basic elements in the structure of the collective unconscious, some sort of "models of behavior," "models of situations" and "models of relationships" that in their sum comprise "transpsychic reality." They can never be controlled by conscious will; they are not "formed" but "experienced." When they are activated, they behave in the same way as the "archetypal contents," as if they were not within us; we always see them in our environment as projections of the imagination [5].

5. The object may be not only a specific object but also its image, or even the image of an abstraction. Hereinafter we will equate object with the so-called generalized inductor of psychotronic experiments.

6. The literature [6] emphasizes the single-point nature of concentration. This can be developed in the following manner: (1) By returning to the initial point of concentration, until this becomes a habit (Wood); (2) By merely observing the thoughts and by not integrating with them (Vivekananda); (3) By suppressing all thoughts, through finding the "external input" and blocking it (Aurobindo). The second method is more difficult than the first one. The third is the most difficult, but the most effective. All three methods lead to a gradual reduction of the number of thoughts that pass through the subject's consciousness per unit of time. The objective, then, is to reduce the number of thoughts to a single one, the one that concerns the object.

7. Psychiatry tells us that the individual's internal psyche is pluralistic. Jung first explained these "skips to other personalities" as the personification of autonomous complexes in the subconscious. Under favorable conditions, the complex compensates the conscious ego and becomes a new "controlling level." It can replace conscious activity for a certain time, or it can occur parallel with conscious activity, while possessing certain qualities of consciousness [8]. Jung developed the hypothesis that the "skips" were an attempt to develop the character further, a sort of prototype through which the future personality attempts to emerge. More than 30 years later, Jung modified his view and generalized it in his well-known principle of synchronicity [5].

8. [Omitted in source.]

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PRETERITOLOGY -- AN AUXILIARY SCIENTIFIC DISCIPLINE?

[Paper by Jan Komarek, Prague, Czechoslovakia, in Czech]

[Text] If we go back in our study to the beginnings of cultural history, to the time when the first systematic attempts to discover the laws of nature were made, then already in this distant past we find a system of teachings, a portion of which is known to us as hermetism. It is not our task to dwell on the history of hermetism or on the details of old teachings. We will merely attempt to reassess the facts contained in them, and to ask whether this is only a matter for historical study or does it contain suggestions also for the advanced science of today. Present-day science provides the means that enable us to research and investigate phenomena that earlier remained unnoticed or on the margin of scientific interest. New branches of science and special scientific disciplines are emerging. This situation allows us to subject to more-detailed investigation also many secrets of the past. In many instances, such investigations have provided valuable clues for the solution of problems in the various areas of science and technology. We believe that the study of old systems, conducted from the viewpoint of modern science, could provide meaningful inspiration for many scientific disciplines, particularly for psychology, medicine, chemistry, etc.

As already mentioned, one of the old teachings is hermetism. What does this term actually mean? It is used to denote a system of doctrines which at that time were known as alchemy, astrology, and magic. It is an integrated system of ideas that define the relationship between man and matter, between man and the cosmos, and finally between man and other natural phenomena. It should be noted, however, that in antiquity the underhand and superstitious practices, which were the main accusations in many of the witchcraft trials in the Middle Ages, were not associated with the concept of magic.

Typical of entire hermetism is an unalterable tradition that can be found in all hermetic works, without regard for the time and place of their origin, but differing in external form in accordance with when and where these works were written. At this point we should emphasize that

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in antiquity most doctrines, and hence also hermetism, were taught at temples, the centers of learning at that time. But the contention is entirely unfounded that hereditary affiliation with this or that class was an obstacle to the study and cognition of these teachings. Decisive were always the results of the physical, moral and mental tests that applicants had to take.

Let us turn to the methods and theory of hermetism. In hermetism's methods of study we find that which today is the objective particularly in the theoretical disciplines: to synthetically extrapolate knowledge from known facts. In many scientific disciplines, however, the method still prevails that analyzes effects as independent phenomena, without regard for their interrelations and mutual interactions. In distinction from such analysis, hermetism employs a special method of analogies that leads directly to synthetism. Hermetism, of course, employed also mathematics (esoteric mathematics).

The theses pertaining to the hermetic methods of cognition, together with the hermetic laws of the triad and the mathematical operations, are presented by Pierre de Lasenic as follows:

Analogy: (1) Analogy is a method that stems from combining deduction with induction; by analogy we define the mutual relationships between two or more phenomena. (2) Two analogous things are not equal; but if they are to be analogous, then all the parts comprising the first thing must be analogous to the same parts of the second thing.

Triad: (1) Every fact is subject to a law; and every law, to a principle. Laws are secondary causes, while principles are primary causes. There exist an infinite quantity of facts, a limited area of laws, and a very limited number of principles. Exact science, which confines itself to the study of phenomena, cannot abandon the area of facts because it operates on the basis of analysis.

Numbers: (1) The basic operations in esoteric mathematics are hermetic reduction and hermetic addition.

Lasenic goes on to say: "The hypothesis of an entire series of analogies, which are the connecting link in the chain of events and their causes, is the actual basis of all study. Hermetism not only starts out from this hypothesis but also recognized the law that every thing, being or phenomenon must necessarily produce its own analogy, or be caused by it, in order to exist. In accordance with the locality of the relationships, we may classify analogies into several principal classes. Let us name two such classes: (1) Cosmic analogies, which define the analogy between the cosmos and terrestrial life. (2) Natural analogies, i.e., analogies between physical creatures of this world. The old teachings distinguished the macrocosmos and microcosmos. The latter combined man and other creatures into a small universe, similar to the cosmic universe. In this

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way hermetic philosophy localized in the human body, respectively in the bodies of terrestrial beings, the entire cosmic planetarism that was based on powerful series of signs: the seven planets, and the 12 signs of the zodiac."

We will not enter into a more detailed analysis of the problems but will merely point out the facts that deserve closer study and interpretation. The sun's effect on life is generally proven and significant; statistics are available which show the relationship between solar activity and the occurrence of diseases; in historical annals we often find reports that various epidemics preceded frequently an eclipse of the sun. And here the following question arises: Does this factor influence the human organism's resistance to disease? We also know the sun's effect upon the behavior and reactions of most people: the accident rate rises on certain critical days, and there is an increase in the number of cardiac cases. Here we may immediately apply the law of planetary analogies that are thousands of years old: the sun is analogous to the brain and heart in the human body. And another question: Why did scholars in antiquity find that specifically these organs were analogous to the sun? We probably will never know the exact answer, but we can say with certainty that the scholars in antiquity were always excellent and careful observers who found analogies and connections that literally were amazing.

Alchemy is a more obscure art, and more difficult to follow. Preparation of the philosopher's stone was not its only objective. It solved also other problems such as, for example: the alkahest, a universal solvent; the separation of spiritus mundi, a substance that revived weak matter; preparation of hermetic medicines; preparation of aurum potabile that makes the organism maximally resistant to all disease; and preparation of the elixir of life that rejuvenates and regenerates the organism through cellular exchange. Already from this simple listing we see that some of the problems have remained timely even to date. After studying the alchemical literature, all that we can say today is that it indisputably contains a rational core.

Concerning the first problem, preparation of the philosopher's stone, it is very difficult to adopt a standpoint on it, because we do not know what starting materials the alchemists used; or more accurately, the allegorical and symbolic language does not define these materials clearly. Morover, in the alchemistic literature we find many contentions that obviously are intentionally contradictory, specifically the passages concerning the selection of starting materials. If a modern chemist were to ponder the description of the raw materials, he would arrive at the following conclusions: The most suitable are the polymetallic ores, so-called tetrahedrites that contain mercury, gold, silver, antimony, copper, and other elements. Both the mercury and the silver content in them may be fairly significant, and they often contain also a small proportion of gold. There is a relatively abundant mineral called hermesite, and it contains mercury and silver. But we were unable to determine whether this name is connected in any way with hermetism.

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The actual process, that of preparing the philosopher's stone in a narrower sense, is described more or less thoroughly. But specifically the first phase -- i.e., selection of the raw materials, and separation of the so-called [Aristotelian] elements -- is concealed the most, because apparently herein rested the secret of the operation. It would be difficult to imagine that the work of the alchemists was demanding in terms of equipment and procedures. The results achieved with the simple equipment and technology available at that time were in many instances such that they are difficult to duplicate even with present-day methods. According to a claim made by one of the philosophers, their art (alchemy) was "amusement for women, and play for children." The third phase was concerned with the trasmutational abilities of the operation's product. Views vary regarding this product that was obtained in an operation lasting 10 to 13 months. The temperatures employed in various operations, particularly in the preparation of medicines, were relatively low, about 30°C. This factor, in combination with the sufficiently long time for the processing of the raw materials, made the occurrence of the reactions and the gaining of the product possible even when the yields of these products, using modern methods, would be very small.

The theoretical foundation of these operations was the sulfur-and-mercury theory that in its way is interesting. It follows from this theory that the development of all metals ends with gold and does not continue further. From nuclear physics we know that the end product of natural-decay series is lead and not gold. The alchemists, of course, never contended that they obtained gold through the decay of other elements. Judging by the techniques of their work, we may safely exclude the path of high energies that are used today in particle accelerators to attain nuclear transformations. Thus, here again we may ask: Is there some other way of influencing the nucleus and of attaining atomic changes, than with enormous energies? For the time being, nuclear physics answers this question in the negative. This answer, of course, is not necessarily the final one.

The other problems of alchemy, particularly the question of the elixir of life, are problems that are being studied with great interests, although from a slightly different viewpoint, by some scientific disciplines such as gerontology, etc. We believe that suggestions are to be found also here. The nontoxicity of the overwhelming majority of spagyric preparations, and the methods of their formulation could provide valuable lessons for pharmacy.

If we consider the problem of potable gold, in the literature we can find many references that the spagyrists attempted to convert metals into solutions, for medicinal purposes. The lily of Paracelsus, for example, was a solution obtained by the action of alcohol on a mixture of powdered metals (one of the metals used was antimony). These metals do not dissolve perceptibly in ethyl acohol. The formation of alcoholates does not come into consideration in the case of these metals under the given

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conditions. In other words, the healing power of this preparation evidently stemmed from the insignificant quantities of dissolved metals. After all, the bactericidal effect of silver is well known, but the role that trace elements play in the organism has not been explored completely by far. As can be seen, the old chemical literature provides an abundance of material for more-detailed investigation.

Hermetism studied also the psyche. The scholar in antiquity started out in his work from a conception that there existed a world beyond the level normally accessible to conscious perception, and that communication with this world was feasible. He applied the hermetic laws of analogy, and for his actions he selected the suitable day, hour, and color of clothing; in sum, an entire ritual had to be adapted to the objective of his work. Today when there is debate on the phenomena of psychokinesis, telepathy and clairvoyance, when it is difficult to find subjects with suitable faculties for the experiments, there arises the problem of the method that scholars in antiquity had to master in the course of their training, so as to be capable of the various operations that had an impact on the physical world as well as on the psyche. When reading the hermetic literature on the psyche, one necessarily gets the impression that the scholars in antiquity knew much more about the human psyche, and about the paths leading to man's innermost self, that what is apparent from thier writings. From the preserved reports it follows first of all that these scholars were not only theoreticians but skilfull experimenters and practitioners as well. First of all, the scholar in antiquity had to know how to form a dynamic image that arose in his mind but was able to act also outside it. There were various imagination techniques to develop this ability, but in psychically less stable individuals they often led to a loss of sanity.

Many present-day authors -- Claude Levi-Strausse, for example -- are investigating the problems of magic in its social, psychological and ethnological context. For a deeper understanding of psychic events, it would be expedient to focus attention on the training methods that the scholars in antiquity used to develop various abilities. Preserved reports from antiquity reveal that only the individual who was morally mature and had passed strict tests was initiated into these practices. We know that the novice had to subject himself to strict discipline and self-denial, but there is very little in the literature on what psychic exercises they performed. Today when man is exposed to psychic tension and stress situations more strongly than ever before, when the treatment of diseases requires access to the unconscious that cannot always be achieved with psychopharmacologic drugs, study of the historical methods becomes fruitful. There is an entirely demonstrable relationship between the methods of psychoanalysis, depth psychology, autogenic training, etc., and the manner in which the scholars in antiquity worked their conscious and unconscious. Also here, modern psychology could use suggestions from history.

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Closing this brief outline of the problems of old historical teachings in relation to modern science, we would like to emphasize certain social and ethical aspects of hermetism. It is typical of old teachings that they, unlike many philosophies and religions that limited the development of man's personality, did not attempt to define man's origin, his destination, and what he may and may not do. The faith of the ancient scholars in man's power, in the ability to master nature and the phenomena surrounding them, their belief in things some of which seem almost impossible to us even today, made them a progressive force that worked in the background, but the more effectively, for social progress. And this faith in man, in his infinite capabilities, may be regarded as the most important heritage of hermetism for our time.

Futurology has been defined as an auxiliary scientific discipline, the purpose of which is to anticipate the new with sufficient lead time, and to offer suggestions for science. In the course of studying the historical sciences, it seems to us that we should consider, as an extension of fuutrology, also another auxiliary scientific discipline, which could be called, say, preteritology. (In the 1920's, the French were considering paleotechnology.) Its mission would be a critical evaluation of the empirical knowledge contained in old sources. Our reasoning is not guided by a fervent hope of finding modern knowledge in old manuscripts, but we often are amazed to see that we are discovering what has already been discovered long ago. There are such scientific disciplines as the history of chemistry, the history of medicine, etc. But they are inadequate because, without a comprehensive approach, we find it difficult to perceive the real core under the symbolic. And then what should be stimuli for research become at most a matter of historical interest. And that is not enough.

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PURPOSIVE ACTIVATION OF MENTAL ACTIVITY IN THE LEARNING PROCESS

[Paper by Gennadiy A. Samoylov, doctor of juridical sciences, professor, Moscow, USSR, in Russian]

[Text] The General Problem. Intensification of the learning process in higher education by means of fuller use of the intellectual potential of students.

The Problem Under Study. The possibility of intensifying creative perception and assimilation of knowledge by means of the effect of psychic tension.

The Nature of the Problem Under Study. Learning, whose basic elements are explanation and memorization, can no longer fully meet the requirements imposed on it either with regard to the creative activity of the knowledge acquired or with regard to the principles governing the formation of such knowledge. In spite of large expenditures of time and labor, in the principal forms of this system of learning knowledge is more and more acquired in a passive manner, mainly through the efforts of the memory. Consequently, newly acquired knowledge does not become a unified complex of concepts by any means immediately, but usually consists merely of quantitative relationships.

If we examine the nature of the learning process from the standpoint of contemporary social and pedagogical requirements, then it must above all be active (if we leave to one side its functions in the domain of moral upbringing), and a maximum stimulus should be given to development of the habits of creative (scientific-theoretical) thought, independence of action, and, as a consequence, a high coefficient of the usefulness of those actions must be insured to a definite degree. There is no question that these features and peculiarities of the learning process are already inherent in higher educational institutions, but they still have not become the determining factors in their everyday activity. That is why the problems of improving the teaching process of higher education and of intensifying it are still very topical.

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Solving this problem ought to be related primarily, if we are to argue logically, to creation of an optimum structure for the teaching process as a whole. If we are to rely on the experience we have acquired in this regard, then the points of departure in sketching a model of that process ought to be broad and more effective use of the internal relations that exist between the fields of knowledge being studied; strict adherence to a system in the study of any one of them separately (singling out the fundamental concepts, increasing the size of units to be assimilated, and so on); selection of that portion of scientific information which is essential to forming in the students solid foundations for general and specialized knowledge, foundations that guarantee assimilation not only of the contemporary achievements of scientific thought, but also constant renewal of the stock of conceptions and concepts engendered by the further development of science, engineering, culture, and art. This selection of scientific information can solve not only the problem of a purposive choice of subject matter, but also another important problem, that of creating economical or otherwise compact means and forms of expressing that information. This process of what we might call compression, and compaction of scientific information is already observed in many fields of knowledge. This will undoubtedly have a favorable effect in expanding the possibilities for the use of that knowledge, including its use for educational purposes.

Improvement of the learning process in higher education depends greatly on qualitative improvement of its principal forms and on a search for the most rational systems of the mutual relations between those forms. Those relations might be defined, for example, as follows: the introductory lecture--independent work of the students on the subject matter being studied--seminars--the final lecture--and laboratory exercises. It is easy to see that this variant of the possible composition of dependent relations between the principal forms of learning, taken to illustrate the proposition being advanced, could have a favorable effect in invigorating the transmission and assimilation of knowledge. In this case these processes would actually become more tense with respect to the mental activity displayed by the students in their acquisition of knowledge. The students would in this case be in a kind of special psychological state.

It is not excluded that intensification of the learning process in higher education will to some degree depend on the results of practical realization of that conception in learning theory which advocates that the emphasis in teaching be shifted from assimilation of knowledge to the mastery of methods which later will make it possible to acquire the knowledge.

But teaching methods exert the most substantial influence on invigoration of the process by which knowledge is formed and on improvement of the effectiveness of that knowledge. Improvement of those methods is bound up very closely with the quest for new pathways to the enormous intellectual reserve of students which are still not adequately utilized and is an essential prerequisite for creating and developing modern forms of creative mastery of knowledge. In this case those elements of the teaching method

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which are based on the very specific reaction of the mind we have called the effect of psychic tension may be of considerable interest.

The effect of psychic tension is an active state of thought and to some degree of the emotions caused by intellectual collisions introduced into the methodological structure of the teaching process; these collisions are certain relationships between components that conflict or phenomena (concepts, propositions, etc.) that simply differ from one another but which, just as in the former case, have a common basis.* Consequently, their mere comparison willy-nilly leads to an immediate concentration of the mental tension that occurs at such moments on clarifying the nature of each phenomenon (concept, proposition, etc.) that is in "conflict" with some other concept or proposition and on becoming aware of those relationships between them that reveal the still deeper nature of the properties and peculiarities of each of them. That is why under these conditions the process of the formation of knowledge is considerably more intense, as if the effort of the intellect had been doubled. In addition to the perception and assimilation of information that has positive significance, thought, which in this case undergoes comprehensive development, penetrates more freely into the dialectics of internal and external relations and gets to the foundations of logical or other relationships between the phenomena being studied. Properly speaking, all of this is to a considerable degree a manifestation of the effect of psychic tension. But we should also bear in mind that invigoration of mental activity through the analysis of intellectual collisions may also be intensified because of the emotional state that is heightened at the same time, because of the newness of the problems being studied, and finally, because clarification of the collisions themselves is usually achieved not through an unambiguous solution of the problems contained in them, but through an ambiguous solution of those problems.

The effect of psychic tension, which is one of the basic stimuli of the cognitive activity of students, not only brings about active perception on assimilation of knowledge, but also serves as an essential prerequisite for the awakening in them of a profound interest and a creative attitude toward the knowledge acquired, and to some extent we can say that it predetermines their desire to constantly enrich themselves with new scientific information.

Approaches to a Solution of the Problem Under Study. The cognitive foundations of the methodological elements of teaching which are related to use of the effective psychic tension are embodied in that dialectical contradiction which is manifested daily between the inevitably more complex requirements imposed on students as they study new material in the syllabus and the knowledge they have previously acquired and which is still insufficient for accomplishing the goals that are set at the given moment. This contradiction and everything related to overcoming it is the basic driving

* "Forked situations" in so-called problem teaching may with some reservation be regarded as special cases of this kind of intellectual collision.

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force in the learning process (even when other teaching methods are used). and it determines the methodological structure and logic of that proce:.

Contradictions in formal logic and also contradictions of a psychological or cognitive character are usually used in setting up intellectual collisions to be introduced into the learning process. An investigation of the nature of these contradictions is undoubtedly also very important to an understanding of the "stimulative mechanism" embodied in them. But these contradictions by no means cover all the factors which can arouse creativity in students at moments when they are searching for a necessary solution to the problems contained in intellectual collisions. We should note in this connection that the psychic tension this involves immediately exerts its influence in two directions: on the one hand it gives rise to a desire to eliminate the contradictions that constitute the essence of the intellectual conditions, and on the other it stimulates a search for a solution to the entire problem under investigation (being studied), but not just any solution, but the solution that is optimal in all respects. It is still difficult at the present time to say why all of this occurs just the way it does, since processes of mental activity of this kind have still not been sufficiently studied. But one can confidently assert that the general activity of thought that is manifested in these cases promotes the search for an optimum solution.

The methodological procedures bringing about the occurrence of the effect of mental tension are not introduced into the structure of the teaching process separately from traditional procedures. They do not replace one another. Combining them sensibly is the essential condition which insures creation of a teaching system which will be most perfect from the methodological standpoint. Should we try to state how they should relate to one another in the teaching process, then we would have to admit that traditional teaching methods have a dominant role here. This is altogether understandable: if they are widely used, for example, in the presentation of axiomatic concepts which are always predominant in any field of knowledge. But another point is also beyond debate: if the mental activity of the student is not activated, if its critical aspects are not developed as they perceive and assimilate new material in the syllabus, the traditional methods cannot fully insure the level of scientific-theoretical training we need today.

Possible Variants of a Solution to the Problem Under Study. Intellectual collisions engendering the effect of psychic tension may be introduced as independent elements into the methodological structure of lectures, seminars, laboratory exercises, etc. We will attempt to explain their role and importance in these forms of the academic process.

In an academic institution the lecture is the principal one of the original sources of information concerning that knowledge which is acquired by students. The peculiarity of the transmission of knowledge in a lecture is primarily that a direct information link is apparently established here

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only in the direction from the lecturer to his audience. Feedback (questions, clarifications, etc.) may be altogether absent in this setup, but its latent forms manifest themselves constantly. This feedback is extremely autonomous and the "radius" of its effect is strictly limited to the concealed response reactions of every student to the information arriving along the one-way communication channel. These response reactions consist of the desire of those sitting in the audience to succeed within certain intervals of time in perceiving (grasping) and fixing in their memory (or usually in their notes) the nature of the laws, propositions, concepts, and so on, that are being set forth.

When the subject matter of the lecture is presented in the conventional and traditional way, since it follows the pattern of sequential presentation of fact, the mental activity of those listening to the lecture is "underutilized" with regard to generalization, associative connections, and so on, and in this sense we can say it is passive.

If intellectual collisions (for example, in the form of one or two new pieces of information) are introduced into the methodological structure of the lecture, this sharply increases mental activity, which takes on corresponding emotional coloring and makes the transition from a mere meditative perception of the subject matter to critical conceptualization of that subject matter; that is, the first step is taken toward a creative grasp of the problems making up the content of the lecture. But the importance of the effect of psychic strain as an activator goes beyond that. The dynamics of the search (even though it be very brief) caused by the intellectual collision gradually reveals an interest in knowledge which is very strong (as in everyone who comes into contact with science), though up until that time it had still been largely potential. Development of this interest is precisely one of those aspects of the lecture method of conveying knowledge which serves as a primary foundation for forming the scientific outlook in the students and for forming their attitude toward science as a whole.

The psychic tension created in this way serves as the first impetus toward the students' display of an interest in learning and development of creative perception of the field of knowledge being studied.

The content of the new bits of information introduced into the methodological structure of lectures lies in the fact, as we have already mentioned, that it can be expressed by means of contradictions in formal logic or contradictions of a psychological and cognitive nature. The content of the specific division of the syllabus is the initial material for creating intellectual collisions. But the state of the effect of psychic tension may be caused not only by intellectual collisions, but also by certain ways of presenting the subject matter of the lecture. They might include the following, for example:

a. presentation of points of view that treat in different ways a particular scientific concept, proposition, or phenomenon, which gives the students

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an opportunity to compare and independently evaluate the evidence supporting them and possibly their soundness;

b. the asking of questions or the posing of problems that force those attending the lecture to react by way of response even though this response is very brief. This can happen, for example, when one is asked to take a position toward a specific fact, to draw a conclusion from the illustrations presented, and so on, even though this be in the simplest form of a yes or no.

This kind of methodological procedure in transmitting knowledge is also capable of activating thought processes and of intensifying the learning process of the students both during the lecture and also during their independent work on the problems presented in the lecture.

Seminars, by their very purpose, are necessary to consolidate, broaden, deepen, and more strictly systematize knowledge already acquired. If one follows the traditional pattern of seminars: "the questions in the outline--the responses of the participants--the conclusion of the leader of the seminar," then the mental activity of the students can be activated if they are sufficiently prepared. But this activity, limited by the framework of this method of organizing seminars, is expended mainly on the fullest and most accurate reproduction of knowledge already acquired. Under such conditions the analytical thought of the students is manifested very weakly as a rule and only keeps a check on the logic of the judgments contained in responses to questions or in the presentation. The reasons for this probably lie in the motivation behind the actions of the students; after all, the essence and orientation of the thought process in this case results, as one might assume, not only from the inner need for knowledge, but also from the need to demonstrate their level of preparation for the seminar. That is why their interest in learning in this case frequently does not go beyond the limits of the task that has been set and usually is not creative, but is what we might call operative.

Elements of teaching based on the effect of psychic tension that are introduced in the methodological structure of seminars can considerably enliven the seminars and open up the way toward further improvement of their methodological and psychological foundation. An analysis of intellectual collisions during seminars causes the students to intensify the intellectual part of their mental activity, is an essential condition to formation of critical perception of the content of the material being studied, and serves as a starting point for establishing connections between that material and other fields of knowledge. In other words, creative conceptualization and the mind as a whole participate most fully in the cognitive process when seminars conform to this methodological structure.

To some degree the role of intellectual collisions in a seminar, in addition to situations engendered by contradictions in formal logic or other contradictions, may be performed by the following:

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a. analysis of those propositions under discussion which without excluding one another typify on an equal footing different approaches to understanding the nature of the phenomena being studied and presentation of arguments to support one's own personal attitude toward each of them;

b. the singling out from the totality of certain concepts those conceptions which allow one to judge both the individual elements and also the general structural principles of the phenomenon under study;

c. concretization of the propositions of the syllabus being studied by means of factual data.

We have merely attempted to find a fundamental solution to that part of the problem under consideration which is our subject of investigation at this point. The leader of the seminar, depending on the specific conditions, will, of course, decide himself in every case which methodological structure of the seminar he will choose.

Laboratory Exercises. Laboratory exercises shape in students the foundations of those qualities needed by the researcher because they give the students every opportunity to use the theoretical knowledge they have acquired to solve practical problems. That is their main purpose. These exercises (along with other teaching methods, of course) first lead toward mastery of the methods of the field of knowledge being studied by the students, and then, as the syllabus becomes more complex, they insure that this task will be accomplished. Importance in this respect should be given not only to academic notions concerning the content of the laboratory exercises, but also the real requirements of development of scientific knowledge and the needs of modern production or of any other sphere of social practice. Their content, based on the very latest achievements of science and engineering (which is quite natural), considerably enhances the students' interest in learning. And this interest in turn activates the students' mental activity as they also master the practical aspects of the knowledge they have acquired.

Because of the specific peculiarities inherent in a large number of fields of knowledge that are different in content, the methodological structure of laboratory exercises can by no means be strictly invariant. But this circumstance does not exclude, but rather presupposes, the existence in it of common elements which under the specific conditions can exert a considerable influence on the cognitive orientation of these exercises as a whole. If we limit ourselves to the purposes of the present study, then scientific exploration ought to be singled out as the common element in differing variants of the many methodological structures of laboratory exercises. It is quite understandable that this kind of research does not have the scientific importance we customarily associate with the term: the results obtained in it do not provide new information to enrich the knowledge already available. In this case it serves as an essential prerequisite for development of research habits in the students.

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Nevertheless, scientific research is one of the most active elements in the methodological structure of laboratory exercises. Logic, dynamics, and the purposeness of actions performed in the course of the research--all of this taken together constitutes a rather large totality of very unique difficulties that intensify mental activity. With respect to their psychological nature, these difficulties differ somewhat from the intellectual collisions we have already discussed and which are introduced into the methodological structure of lectures and seminars, but the results from the use of both are almost always on the same order. Collisions in research greatly favor the occurrence of the effect of psychic tension in the students during laboratory exercises, and this effect activates precisely those processes of cognition which are primarily related to the methodology of research being conducted in those exercises, to their practical orientation, and to their specific features.

The distinguishing characteristic of laboratory exercises is that the information link between the supervisor and the students is considerably weakened. It is not uncommon for it to disappear altogether in this case. A special complex of logically interconnected actions to be performed during work on the problems of the laboratory exercise can under these conditions successfully perform the role of the guiding factor that stimulates vigorous mental activity on the part of the students and that helps to develop research habits in them. This complex incorporates into the formative habits of the future researcher the qualities of system, rationality, and purposiveness of action, exerts a beneficial influence every time the student concentrates his mental efforts on the main problem, and, in the final analysis, it insures independency in the search for the solution to the problem that constitutes the essence of the laboratory exercise. If the problems of the laboratory exercise have empirical importance, then this complex of actions (without going into the details of its elements) usually includes the following:

a. clarification of the nature of the problem (phenomenon, the properties of a substance, etc.) which is to be solved as a laboratory problem;

b. definition of the group of hypotheses which can be used in this case, evaluation of these hypotheses, and selection of one hypothesis which in the opinion of the person doing the research ought to insure discovery of the optimum solution to this problem;

c. discovery of the possibilities of specific scientific methods of cognition and research equipment when used to achieve the goal that has been set;

d. determination of the algorithm of actions to be performed in searching for the necessary solution to the problem that is contained in the assignment;

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e. immediate cognition of the properties, aspects, and characteristics of the phenomenon (event, object, substance, etc.) which is the object of the investigation in question;

f. evaluation of the results obtained, conclusions concerning the solution found, and documentation of those conclusions.

Research Work. It is self-evident that the complex of actions just discussed can be successfully used not only in laboratory exercises, but also in performing many research projects that have an empirical basis: for example, the diploma projects, topics called for in the curriculum of a scientific society, and group research done jointly with a scientific supervisor.

There can be no doubt that in these and similar cases the complex of actions we have presented will need appropriate correction. It seems to us that these corrections should be sought primarily in those actions which are related to an independent posing of the problem (task) and with the most effective method of investigating it. In our opinion, when research of an empirical nature is being done, one should use not only the generally known methods (observation, experiment, etc.), but also such methods as calibration, the method of analogs, etc. They make it possible to take into account more precisely those specific features which are inherent in empirical research as a whole.

If scientific projects to be performed are devoted to investigation of the theoretical aspects of a problem, then the complex of logically interconnected actions to be performed in this case would include the following:

a. conceptualization of the theoretical foundations of the forthcoming research and the working out of an algorithm of actions relevant to conducting it;

b. analysis of the available factual material and advancement of hypotheses that make it possible to search for a solution to the problems being investigated;

c. a comparison of the known nature of the events and phenomena (where this learning is the result of an investigation of factual data) with explanations so far available; documentation to support one's own conclusions;

d. scientific recommendations concerning the most correct conception of the nature of the facts, phenomena, or subjects which were the focus of the investigation that has been done, concerning further improvement of methods of grasping them, concerning measures to be worked out that would favor the development of the phenomena under investigation or that would prevent the occurrence of undesirable consequences, and so on.

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The common denominator in the methodological structure of laboratory exercises and research performed independently is the broad use of scientific hypotheses as an essential condition for finding the necessary solution and, in the final analysis, as a means of cognition. Several hypotheses are usually advanced for this purpose. Even in this case they are made subject to the general requirements that every hypothesis advanced must be based on a specific group of actually existing facts and must include a critical analysis of other suppositions which explain them in a different way from different points of view. In the initial stage these hypotheses are given equal credence. Then they are differentiated and evaluated, and this process ends with the selection of a working hypothesis. It is supported not only by the arguments embodied in its internal logic, but also by the fact that it is most significantly and abundantly supported by the factual material that was the focus of the investigation conducted, and, naturally, by the convincing evidence that precisely this hypothesis explains its nature more correctly and fully.

Brief Conclusions. The effect of psychic tension caused by intellectual collisions deliberately introduced into the methodological structure of the teaching process, by activating the mental activity of the students, is capable of considerably intensifying the development of creative perception and assimilation of knowledge, beginning with its first source--the lecture--and ending with projects of a research nature that are independently performed.

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